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LECTURE III.*

(Delivered on March 8th, 1921.)

IN my first two lectures I have spoken about the fate of the sugar in the blood and the types of diabetes mellitus which are already recognised. In this lecture I shall briefly discuss the hypotheses for the cause of diabetes, and then go on to discuss the principles and details of the modern treatment.

CAUSATION AND TREATMENT OF DIABETES.

The association of the pancreas with the disturbance of sugar metabolism has been completely established by the work on the extirpation of the pancreas. The original observations of Minnowski and von Mering have been greatly extended by Allen's work. Further, the islands of Langerhans are recognised as distinct entities, mainly as the result of the work of Bensley[1] and Homans,[2] and the pancreas is therefore a double gland with its external secretion into the intestine and internal secretion into the portal vein. It is also believed that the islands are concerned with the metabolism of sugar, as definite changes occur when the surviving remnant of the pancreas of a dog is overworked. It would seem therefore that the association is one which could easily be confirmed by post-mortem examination. The state of the islands in dogs in whom diabetes has been produced by removal of a large fragment of the pancreas coupled with excessive carbohydrate feeding does suggest it. These cases show hydrops of the cell, and the characteristic granules are absent; the cells have an exhausted appearance. In long-standing cases, however, it is difficult to make out changes, as the cells gradually die and there may be no sign of hydropic degeneration (Allen[3]). In man the evidence is by no means so good. This is partly due to the long-standing nature of the disease and partly to the fact that the pancreas undergoes very rapid changes after death. By its position in the body it is kept very warm, and is usually invaded early by bacteria. Unfortunately, it cannot often be examined soon after death. Further, the staining reactions of the ordinary acini are usually very poor in comparison with those obtained from a fresh specimen. Consequently it is not really surprising that the finer details, such as the presence or absence of granules in the cells of the islands, cannot readily be made out.

Opie[4] observed that the fibrosis which is seen in the pancreas may involve the islands of Langerhans, but these may escape if the changes are chiefly around the acini. Weichselbaum and Stangl[5] have greatly extended Opie's work; they pointed out that there was also a change in the cells of the islands, which they called hydrops of the cells. The discovery of the specific granules by Bensley has added a further test of the functional activity of the cells. If the pancreas of diabetic patients is examined fairly early it is possible to form some idea whether the islands are affected or not. One of the difficulties is that changes of this kind do occur in the island cells of patients who have never had diabetes. It is therefore necessary to examine many portions of the pancreas so as to form some idea of how many of the islands are affected. Allen[6] has recently stated that working under these conditions he has been able to make a correct diagnosis in nearly 100 per cent. of the cases of diabetes and non-diabetics that he examined. If the pancreas was badly preserved it was not possible to give an opinion.

This work establishes the hypothesis that the islands of Langerhans are intimately related to diabetes, but the cause of the damage to the islands remains obscure.

Hypothetical Causation of Glycosuria.

Extensive involvement with a neoplasm very rarely causes glycosuria. General diseases of the pancreas, such as acute and chronic pancreatitis, rarely cause more than a transient glycosuria. This is probably due to the fact that the islands are little affected by the disease which has affected the acini. Thirloix[7] has completely destroyed the acini of the pancreas of a dog by injecting into the duct a mixture of oil and lamp-black without causing any glycosuria. Also the amount of pancreas which is necessary in the dog to prevent glycosuria is small; the survival of a one-eighth to one-ninth of the gland is sufficient (Allen[8]).

Syphilis of the pancreas may be a factor in causing glycosuria in some cases.

Warthin[9] found definite changes in the pancreas which he regarded as characteristic of syphilis in 13 out of 14 cases of diabetes. In 2 cases the *Spirochæta pallida* was found in the pancreas and in 5 cases in the myocardium. Fibrosis of the islands was well marked in 11 out of 13 cases. Warthin did not assert that syphilis was the cause of diabetes, but only that it was a common cause of interstitial pancreatitis, and that if interstitial pancreatitis is the cause of diabetes syphilis must play a large part in its causation. Whether or no syphilis is the prime cause of the diabetes it may well be a contributing factor in causing a gradual destruction of the islands, and so of the gradual decrease of sugar tolerance with which the clinician is so familiar.

Since the general diseases to which the pancreas is liable do not seem to produce marked changes in the sugar tolerance it is permissible to speculate whether the islands can be affected by a specific agent which affects them without damaging the rest of the pancreas.

The evidence in favour of this hypothesis is slight at present. The instances of sudden onset of very severe diabetes which I mentioned in my last lecture suggest that a very widespread damage may be done to the islands throughout the pancreas. It is difficult to conceive on our present knowledge how this damage can be done. There is no evidence of any infecting organism, and only one of my cases had any other symptoms besides thirst. In this case malaise was complained of and the boy was kept in bed for three days, and then returned to school for three days before being admitted to hospital. We do not know any real parallel to such an infection. It is true that the pancreas is damaged in acute pancreatitis—a disease of which we do not know the cause. Mumps affect the salivary glands, but may also affect the pancreas (Feiling[10]) and the testicles.

The evidence for a specific toxin or chemical poison is very little stronger.

It is true that the tetanus toxin is specific for the motor neurons and for no other part of the nervous system. But even if there is a specific toxin for the islands, there is no evidence where or how it arises. The evidence, therefore, for any specific agent which could damage the islands is very slight.

If, however, the islands are affected by such a specific agent it is much easier to explain the different grades of severity of diabetes which occur. In the mild cases comparatively few islands would be damaged, but in severe cases the number of islands destroyed would be very great. The gradual decrease of tolerance can be explained as being due to the destruction of more islands.

It has been suggested that stimulation of the sympathetic nervous system may play a considerable part in the causation of diabetes, and this view has recently been put forward by Langdon Brown in the Croonian lectures, 1918.[11]

It is accepted, as I pointed out in my first lecture, that stimulation of the splanchnic nerves produces glycosuria by causing an increased output of adrenalin. This may well play a part in the causation of the mild type of diabetes which occurs in elderly people with many business worries. It can also increase the amount of sugar excreted in other cases, but it does not seem probable that it can be a cause of severe diabetes. Allen's[12] criticism that stimulation of the sympathetic system can only produce glycosuria if the pancreas is already damaged does not agree with the observations of McLeod[13] on the healthy football players who passed sugar while watching a football match. But it is obvious that if the pancreas is damaged sugar will be more readily excreted after splanchnic stimulation.

* Lectures I. and II. appeared in THE LANCET of May 7th (p. 951) and 14th (p. 1003), respectively.

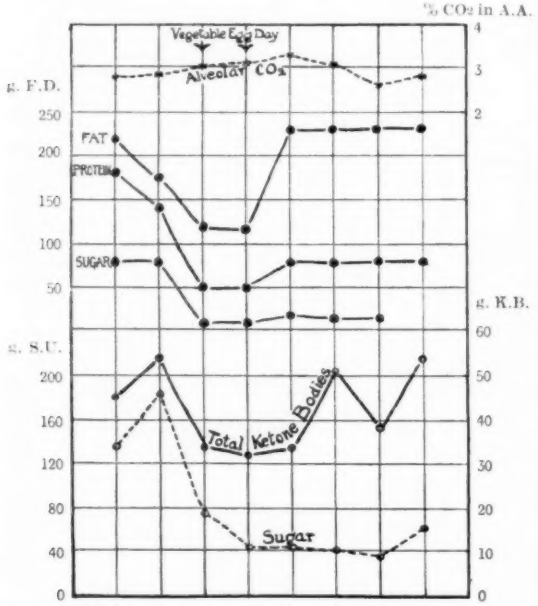
Treatment with Extracts of Pancreas.

Since we are still in ignorance of the cause of diabetes there is no chance yet of any preventive treatment. As the disease is probably due to the damage of the islands of Langerhans, I must first of all consider the question of treatment with extracts of pancreas. Many attempts have been made to treat cases with extracts of the gland on the line of the successful treatment of myxœdema with thyroid extract. These, however, have all been failures, and no improvement has resulted.[14] The attempt to graft a portion of a healthy pancreas into a patient is likely to fail for the following reasons:—

In order to make a successful transplant of a gland it is essential that the graft be taken from a member of the same species. Fresh human pancreas is exceedingly difficult to obtain, but I have been told of one unpublished case (Grant) where the graft was made from the pancreas of a man who had just died of a head injury. It is possible to obtain a pancreas in this way a few minutes after death. It is also essential that the donor should belong to the same blood group as the patient.

Further, the gland must be placed in a position in which the internal secretion can pass to the liver via the portal vein, as Hedon[15] showed that it was only efficacious under these conditions. This fact adds considerably to the difficulty, and it would be necessary to open the abdomen in order to place the graft in the portal circulation, and diabetics stand an operation badly in any case. Pratt[16] has succeeded in one case in making a graft in a dog by burying the gland in the spleen. Most cases of transplantation cannot be said to be successful.

The attempt to influence the sugar metabolism directly by means of drugs has now been given up as useless.



g. F.D. = grammes food in diet. g. S.U. = grammes sugar in urine.
A.A. = alveolar air.
g. K.B. = grammes ketone bodies in urine.

FIG. 1.—Showing effect of a vegetable and egg day on output of sugar, total ketone bodies, and alveolar CO_2.

Codein, which had a great vogue at one time, is of little value except in the later stages of the disease, when it makes the patient's life more tolerable by its sedative action. By soothing the patient's temper sympathetic stimulation may perhaps be diminished and the glycosuria may decrease. Two kinds of drugs are, however, of use for other reasons: (1) One of the complications of diabetes is the severe constipation which almost always occurs. This can be treated with a mechanical adjuvant such as liquid paraffin, or better still by agar-agar. The drugs which are of most use are the saline purgatives to which tr. jalapæ in ʒss. or ʒi. doses may be added. Large doses of aloes are of great assistance. The successful treatment of the constipation will be of great benefit to the patient. (2) It is important to maintain the general health of the patient as far as possible, and tonics like strychnine which do not contain any sugar are of some assistance.

As there are no specifics for the treatment of diabetes we are reduced to attempting to correct chemical errors which result from the absence of the internal secretion.

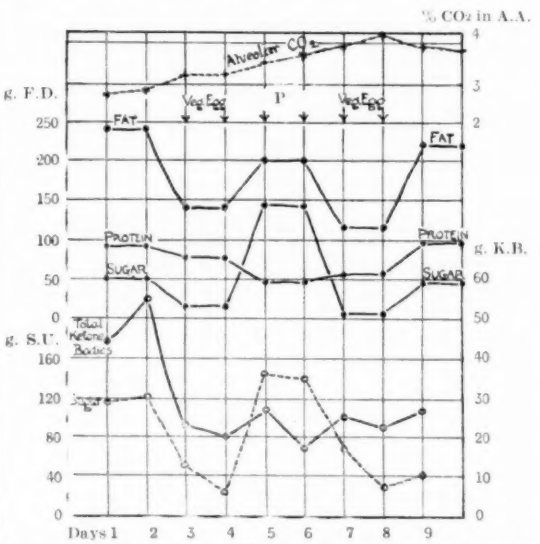


FIG. 2.—Showing effect of a vegetable and egg day followed by potato days on output of sugar, total ketone bodies, and alveolar CO_2. P = potato day.

Tests on Animals.

An exhaustive survey of the modes of treatment has recently been given by Allen, Stillman, and Fitz, of the Rockefeller Institute, and I need only refer in passing to work of different men.

The admirable work of the German schools of Naunyn and von Noorden did not really advance treatment very much, although it paved the way for it. The brilliant but ill-balanced work of Guelpa was largely overlooked because of the exaggerated claim which he made for the treatment of other diseases by starvation and purgation, and also because he neglected the after-treatment. The work of Allen and his school on animals has very greatly advanced the treatment.

The advantages of testing different kinds of treatment on animals, which cannot resist to anything like the same extent as patients, are very great. The difficulty which Allen surmounted was that although diabetes does occur naturally in dogs it is very rare. Further, the diabetes which was produced by complete removal of the pancreas was so fatal that no treatment was of any avail in prolonging life more than a few days. Partial removal of the pancreas, on the other hand, did not produce diabetes. Allen, however, overcame this difficulty by removing more and more of the gland in successive operations until the animal became a diabetic of the grade which he required. He found that he could cause a mild diabetes if the remnant of the gland was one-eighth to one-ninth of the whole gland.[8] The diabetes was severe if the remnant was less than one-ninth of the whole gland. These results were liable to variation, as the presence of a local inflammation rendered the diabetes more severe. On the other hand, some hypertrophy of the gland sometimes occurred. The dogs with the varying grades of diabetes were then treated in different ways and the results observed.

Tests on Human Beings.

The treatment, which was of value, was then tested on patients under the charge of Stillman at the Rockefeller Institute and of Joslin at Boston.

The general principle on which Allen's diet[17] is based is that of under-nutrition of the patient. Starvation is enforced until the patient ceases to pass sugar in the urine. Carbohydrates are then added to the diet in the form of vegetables, and the amount is increased until sugar is excreted. Then the carbohydrate is decreased, and amounts

of protein are added until 1·5 g. of protein per kilo is given. Thirdly, fat is added until the caloric value of the diet is sufficient. The essential point is that sugar should never be excreted in the urine, and further, that the fasting value of the blood sugar should be within normal limits. It is important to note that Allen makes no exaggerated claim for his treatment, as he makes it quite clear that a cure in the true sense of the word cannot be expected.

Conversion of Mild into Severe Type.

More recently Allen [18] has been studying the different methods by which a mild diabetic animal may be converted into a severe diabetic.

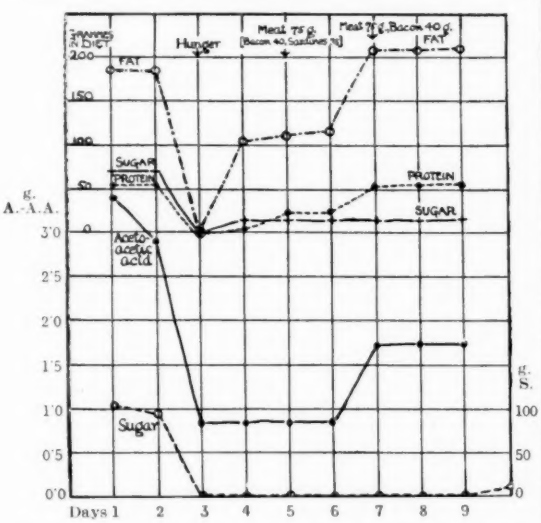
He found that overfeeding with sugar was the best way of converting the mild case into a severe one. The continual overfeeding led to a steady decrease in the sugar tolerance, and the islands of Langerhans showed absence of granules and hydrops of the cell. Similarly, overfeeding with starch converted the mild case into a severe one. Overfeeding with proteins also produced the same effect, but more slowly than in the case of sugar or starch. I will consider the significance of these experiments later on.

As so often happens, other workers had independently and for very different reasons arrived at a somewhat similar plan of treatment. In 1915 Williamson [19] had advocated the use of small quantities of casein and cream, but he did not apply it to very severe cases.

Personal Experiments.

I will now describe some of the experiments which led me independently in 1915 to arrive at a line of treatment which, although it differs from the Allen diet in its details, is based on the same general principle of under-nutrition. The work was interrupted in 1915, and although it has been referred to [20 21 22] it has never been published. My interest in diabetes really dates from 1913, when Hurtley gave a communication to the Biochemical Society on the problems of ketosis.

Hurtley had been working at these problems with the cooperation of Sir Archibald Garrod since 1907, and his work on the four carbon atom acids of diabetic urine is a most



g. A.-A.A. = grammes aceto-acetic acid. g. S. = grammes sugar.

FIG. 3.—Showing effect of a hunger-day, followed by a gradual increase of diet, on output of sugar and aceto-acetic acid.

valuable contribution to our knowledge of the problems of ketosis.[23] Hurtley realised quite early that it was essential to estimate the acetone bodies in the urine when the carbohydrate of the diet was being reduced. If the carbohydrate was reduced below a certain amount there was a sudden rise in the excretion of the acetone bodies which was very difficult to control by the giving of more carbohydrate. The acetone bodies could be reduced, however, if the patient was given the diet of vegetables and eggs, which was part of the régime of von Noorden's oatmeal cure. This sudden decrease in the acetone bodies interested us greatly, and it was to try to elucidate this point that I first joined Hurtley in making the estimations of the alveolar CO_2 and of the ammonia output, in addition to the other estimations. The second patient we examined had a very severe form of diabetes, and had at one time been treated by a prolonged fast after the Guelpa idea. (Fig. 1.)

The sugar output was high, as 189 g. were excreted, although only 80 g. of sugar were eaten. The total acetone bodies were very high, as 54 g. were excreted. When the vegetable and egg diet was given there was a decrease in the sugar output to 47 g. on the second day; of the acetone bodies to 32 g. The alveolar CO_2 rose from the very low figure of 2·8 per cent. to 3·3 per cent., but then declined

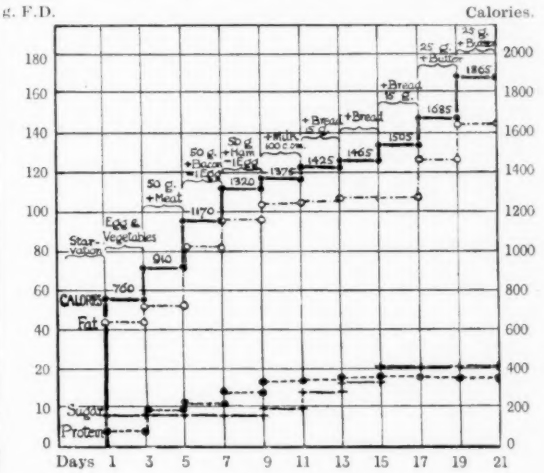


FIG. 4.—Showing total caloric values, and grammes of fat, protein, and sugar, in the "ladder diet."

again. In this experiment the fat in the diet was decreased from 220 g. to 117 g., the protein from 180 g. to 50 g., and the sugar from 80 g. to 12 g. As both the fat and the protein were decreased the reduction in the acetone bodies might have been due to the reduction of either the fat or the protein or both. (Fig. 2.) In the next experiment on the same patient the fat was diminished from 240 g. to 140 g., while the protein was only decreased from 94 g. to 78 g., and the sugar from 50 g. to 10 g. In this case the total acetone bodies decreased from 55 g. to 20·5 g.—that is, the decrease was rather more than in the previous experiment. This experiment strongly suggested what is now well recognised, that the acetone bodies are almost entirely formed from fat. On the next two days 135 g. of potatoes were given and 200 g. of butter. The output of total acetone bodies at first rose to 27 g., but then fell to 17 g. The sugar output was slightly more than the intake—i.e., 142 g. The alveolar CO_2, which was very low at 2·8 per cent., rose steadily through the experiment and reached its maximum at 4·2 per cent. on the fourth vegetable and egg day, but then began to fall.

This is the typical result in a very severe case of the complete régime of von Noorden with the two vegetable and egg days, two potato days, and two more vegetable and egg days. This régime always produced a great temporary improvement, but on the return to the original diet there was an immediate increase in the sugar and acetone bodies in severe cases. We treated several other cases in a similar way and not until April, 1915, was any real advance made. This patient had a severe type of diabetes, but much less severe than the previous patient. Gradual reduction of the carbohydrate in the orthodox manner had failed to reduce the sugar output below 100 g. of sugar on an intake of 70 g. The aceto-acetic acid output was 3·4 g. and in this experiment, as I was working alone, no estimations of the β-oxybutyric acid were made. On two occasions two vegetable and egg days had been tried with temporary benefit only.

On this occasion I decided to try the effect of a complete starvation day (Fig. 6, Lecture II.), but I did not give the abundant purgatives which Guelpa recommended. (Fig. 3.) 1 g. of sugar was excreted and only 0·84 g. of aceto-acetic acid. On the next day vegetable and eggs were eaten, and as he was not passing any sugar and as the aceto-acetic acid output was so low, 0·84 g., I decided that I would not return to the original diet, but increase the food gradually. Therefore, 75 g. of meat were added to the diet on one day. On the next day 40 g. of bacon and 35 g. of sardines were added. One day later the meat was increased to 150 g. and the bacon to 80 g. During this period no sugar was excreted and the aceto-acetic acid output was 1·7 g. At this point some diabetic bread was added and sugar was excreted.

This was the first time that I had tried to increase the diet slowly, although I now regard the increase as a very rapid one. The starvation and gradual increase of the diet was repeated, and the man went out of hospital passing no sugar.

This plan of diet with considerable modifications was tried on eight other patients in 1915 with considerable success, as four of them were on the verge of coma on admission to the hospital. At this stage the work had to be left unfinished, and could not be resumed again until early in 1919, although Dr. Langdon Brown continued to use the ladder diet with success on his patients.

Routine Now Followed.

The diet which we now use remains the same in its general plan, but has been modified in various ways as the result of reading Allen's work and further experience of treating patients. The general routine which we now use is as follows (Fig. 4):—

The patient is allowed his ordinary diet on the first day on which he enters hospital with the addition of 600 c.cm. milk and 50 g. bread unless he is on the verge of coma. The amount of sugar which is passed in this portion of the day is estimated and gives a rough idea of the severity of the disease. Two days' starvation are then given, tea, coffee, meat extract, and as much water as is desired being allowed. Whether the urine is sugar-free or not, the patient is not allowed to fast more than two days at a time. On the third and fourth days the egg and vegetable diet of 5 eggs, 50 g. butter, and 300 g. greens is given. If the patient is still passing sugar two more fast days are given, and this is alternated, as a rule, until the urine is sugar-free or the attempt to get it sugar-free has to be abandoned. If the patient is sugar-free 50 g. of meat are added to the midday meal for two days. On the seventh and eighth days 50 g. of ham are added for tea and one egg is taken away. On the ninth and tenth days 50 g. of bacon are given at breakfast and one egg is taken away. If the patient passes traces of sugar on two successive days he is put back to the bottom of the ladder and made to climb up again. If no sugar is passed 100 c.cm. of milk are given on the eleventh and twelfth days—that is, 4 g. of sugar. This makes the tea and coffee more palatable. If no sugar is passed 15 g. of bread—i.e., 8 g. of sugar, are given in two doses. On the thirteenth and fourteenth days another 15 g. of bread are added, so that the patient gets four doses of 8 g. of bread at four meals. It is most important to divide the carbohydrate among as many meals as possible so as to spread the effect of the dose of sugar on the level of the blood sugar as much as possible. If the patient is doing well the bread is increased to 45 g., which is enough to keep most patients comfortable. If the amount of aceto-acetic acid is quite small, a mere trace, the butter is then increased in two doses of 25 g., watching the effect on the aceto-acetic acid reaction and sugar.

This makes a diet of: carbohydrates, 41; protein, 35·5; fats, 167·5; total calories, 1865, which for a man of 60 kilos is 31 per kilo. The protein is 0·57 per kilo. It is quite true that this represents a considerable degree of under-nutrition, but it seems to be quite enough to enable weight to be maintained and life to be enjoyed. I think that it is wiser not to try to test the tolerance any further at this stage, but at the end of each month, if all is well, the amount of bread can be increased by another 15 or 30 g. if it can be tolerated. This diet is enough to live on and do light work. If, as often happens, the patient passes sugar when he is tested with 15 or 30 g. of bread, he is put back and kept at a lower level for a further period.

Variations of the Routine Diet.

The addition of alcohol to the diet in these severe cases, as recommended by Leyton,[24] is worth a trial, as he has found that alcohol can be given without causing the excretion of sugar. Two ounces of absolute alcohol can be used in this way. The agar-agar and bran biscuits recommended by Allen are of great assistance to the patient, as they provide a medium for eating the butter.

The ladder diet which has developed from the original egg and vegetable day of von Noorden differs from Allen's diet in certain important details. The fast is not continued until the patient ceases to pass sugar, as we find that the patient stands the alternations of egg and vegetable days and fast days better than the prolonged fast. Allen has occasionally found that elderly people are upset by the fast and may have to be fed on the third and fourth days. The routine alternation which we use may explain why we have not noticed any ill-effects. Allen breaks the fast with increasing amounts of vegetables and tests the carbohydrate tolerance on a diet which contains very little protein and fat. Later he increases the protein to 1·5 g. per kilo, and last of all the fat. This scheme is more elaborate than the ladder plan, but it is more complicated for ordinary people to carry out.

The question as to whether it is right to add carbohydrates first and thus test the carbohydrate tolerance, and then add protein, is a very important one and is opposed to our plan. Allen's recent work[18] on the conversion of a mild diabetes into a severe one is very important, as he found that it was much easier to lower the sugar tolerance of a dog by overfeeding with sugar than with starch, and with starch than with protein. Thus the recent work is opposed to the principle of adding carbohydrate first. The ladder plan, which was based on the old idea of avoidance of carbohydrates, appears therefore to be more scientific than Allen's plan. The danger of giving fat is two-fold: (1) It may cause an increased formation of acetone bodies, and the fat intake must be kept low, especially in severe cases; (2) fat has a very high caloric value, and by increasing the fat too much it is easy to break the first principle of the treatment and overfeed the patient. It is very difficult to determine whether the results are better with one plan or the other.

It has been suggested that one reason why the period of starvation produced such good results was that the absence of food allowed the pancreas to rest its external secretion and so improved the internal secretion. Allen[25] supported this suggestion, as he found that ligature of the pancreatic duct of a partially depancreatised dog who was excreting sugar caused the cessation or diminution of glycosuria. This evidence was very suggestive, but it has been shown by Homans[26] that the exclusion of the pancreatic juice from the intestines rendered it difficult for the animal to digest its food properly and it lost weight. Thus tying the pancreatic duct causes under-nutrition, and it is the under-nutrition, not the resting of the pancreas, which prevents the glycosuria.

The treatment of the patient who passes sugar as soon as food is given, in spite of repeated fasts, is very difficult. Unless all hope is abandoned of improving the condition it is better to persevere with a very small amount of vegetables, protein, and fat, adding a certain amount of alcohol. The outlook in a long-standing case of this severity is very bad, but in an early acute case the treatment should be persevered with for a considerable time, as the acute case sometimes makes a surprisingly good recovery.

Exercise in Treatment.

The question of the effect of exercise on the diabetic is a very important one, and Allen[27] has devoted a good deal of attention to it. It has been shown that exercise causes a diminution of glycosuria and hyperglycæmia in mild and perhaps moderately severe cases. In more severe cases, however, this is not the case, and sometimes an increase of glycosuria and hyperglycæmia occurs. Allen is strongly of the opinion that exercise is of great benefit to the general health of the patient.

My experience has caused me to express myself rather differently, and to draw a very sharp distinction between the treatment of the acute stage and of the convalescent stage. Our practice at St. Bartholomew's for some years has been to keep the patient strictly in bed so long as the sugar tolerance was being tested. This procedure was started originally by the sister of the ward, Miss Powell, as she realised that it was impossible to keep a watch over the patients when they were up and about in a general ward. Even when they are in bed they still occasionally acquire carbohydrate surreptitiously. Although the practice was started for this reason, it was soon realised that when the patient was on a diet of very low caloric value it was much better that he should be at rest in bed. The work of Joffe, Poulton and Ryffel[28] on the metabolism of a man who only took 2000 calories per day, or 34 calories per kilo, showed that if the man was taking exercise his energy consumption was just as great as that of a well-fed man, but when he was lying still his basal metabolism was very much less than that of a well-fed man.

If the diabetic learns to lie still in bed he will have a much lower basal metabolism than if he is up, and therefore will be able to live in comparative comfort on a low caloric diet. Last autumn, as a result of seeing the three acute cases which I described in Lecture II., I was more firmly convinced of the value of the method for another reason. If the hypothesis is correct that in an acute case serious damage has been done to the islands of Langerhans, it seems reasonable to suggest that the patient should be treated as if he had had a severe illness. Whether it is possible to influence the course of the disease in any way by keeping the patient at rest no one can yet say, but the practice is justifiable on general principles.

Therefore, if the patient is seen soon after the onset of symptoms he should be kept in bed for a considerable time.

My practice now is to keep the patient in bed for four weeks after he is able to take a diet of reasonable caloric value with about 40 g. of sugar, if that result can be attained. During these four weeks no attempt is made to increase the diet at all. If he is not able to take so high a diet he should be kept at a level at which he does not have to pass sugar for the same period. After that time has elapsed he is allowed to get up by degrees. If he remains sugar-free he should gradually take on more exercise, but should avoid hard work. This advice is easy to give, but very difficult for the labouring classes to carry out. It is important to impress on the patients who have to live on a diet of low caloric value that they must rest properly whenever they are able. When they are convalescent, exercise and fresh air is good for them, as for ordinary people, and a general improvement in health may improve the sugar tolerance.

Determinations of the blood sugar have added a great deal to our knowledge of diabetes and the question arises as to their value in the treatment of diabetes. In the diagnosis of the doubtful cases the estimation of a number of points on the curve after a dose of sugar has been given is of very great importance. By that means, as I have shown in Lecture II., it is possible to settle whether a patient belongs to the class of diabetes innocens or to that of mild true diabetes.

The estimation of an isolated point is, however, of very little value unless special precautions are taken. The figure for the blood sugar of the patient who has fasted some hours is of some assistance in determining the progress of the case, but may mislead the physician entirely unless precautions are taken. If the level of the blood sugar is between 0·15 and 0·18 in the fasting patient it is evidence that the blood sugar is not yet normal and that the islands of Langerhans are still overworked. If, however, the figure lies within normal limits the only information gained is the knowledge that the level of the blood sugar has sunk to normal 12 hours after the meal. It can tell the observer nothing about the response to sugar. In order to do this a dose of sugar must be given and the blood examined at intervals through the next two and three hours. The information gained by such a curve is often of value, but hardly compensates for the great amount of time taken in collecting the samples even though the time taken in estimating the samples is small. Moreover, if it is known that the patient is a true diabetic useful information can be gained by analysing the urine after a dose of sugar to see its effect.

Isolated blood sugar determination can never replace urine examination, for it is very important to know whether sugar is passed or not. When the patient goes out of hospital he should always be taught to examine his own urine. The old teaching was that it was unwise to allow him to test his own urine, as he would be frightened by the discovery of sugar. The modern view is that he should learn as much about his disease as possible and know whether he is taking too much carbohydrate or not. It is better to teach the patient to use Benedict's solution rather than Fehling's solution, as it is easier for him to learn.

When he leaves hospital it often becomes difficult for him to collect his urine. He is apt to test the urine which is passed on getting up in the morning; this urine is usually free from sugar and may mislead him. It is better to tell him to test his urine after the evening meal in which some carbohydrates have been eaten. Testing one sample after a meal is a much more delicate test than testing a mixed specimen.

After-treatment.

The after-treatment of the patient is most important, as it is very easy for the patient to lapse almost unconsciously, and he should be seen at regular intervals.

The treatment of minor or serious illness is a very difficult matter. The usual effect of illness is to make the patient pass sugar and the usual diet for a sick person contains a great deal of sugar. If much carbohydrate is given the islands will be much overworked, and even if the islands escape any damage from the nature of the illness the sugar tolerance may be seriously depressed. The diet should be of a low caloric value, but milk may have to be given, as the ordinary diet is repugnant to the patient. Alcohol should be of use in supplying caloric value. As soon as the illness is over starvation days should be resorted to and the diet gradually increased. Unfortunately, an illness often produces a permanent decrease in tolerance. Great attention should be paid to all minor ailments; boils and pyorrhœa and all sources of infection should be dealt with.

Causation and Treatment of Diabetic Coma.

I will pass now to consideration of the cause of diabetic coma and its treatment. Coma was one of the most dreaded complications of diabetes, but under modern conditions it should be very rarely seen. However, there will always be some diabetics who will die in coma, either because the disease is so acute or because the patient has refused to follow the treatment advised, or in those very advanced and severe cases when the choice lies between allowing the patient to die of under-nutrition or of coma. In the treatment of cases of diabetes it is necessary that the doctor should be able to make estimations of the amount of CO_2 in the alveolar air of the patient.

The most accurate methods are either Haldane and Priestley's[29] or Hasselbach's[30] method. For the clinician Fridericia's apparatus[31] is sufficient and by its use the observer can form some idea of the severity of the case. The usual figures for the alveolar CO_2 is 5·0 per cent. to 5·5 per cent. for men. In a severe diabetic it will fall to less than 3·0 per cent. In my experience this does not mean that the patient is going into coma at once, but that he is in a dangerous state. The man whom I have already mentioned had an alveolar CO_2 of 2·6 to 2·8 per cent. for many days. If the alveolar CO_2 falls below 2·0 per cent. the patient is very unlikely to recover. I have once seen a boy with only 1·8 per cent. who recovered. If the alveolar CO_2 was less than that figure death always ensued.

The determination of the amount of alveoli reserve in the blood by van Slyke's method is of great value, but is not so easily done as the alveolar CO_2.

Acetone, aceto-acetic acid, β-oxybutyric acid are excreted in the urine as a result of the incomplete combustion of fat, and all three substances have been considered at one time or another to be the cause of coma. There are still many misconceptions about these substances. Thus acetone is either absent from, or only present in very small amount in, freshly passed urine, and is formed as a break-down product of aceto-acetic acid—Embden and Schlich[32] and Folin.[33] The nitro-prusside test which Rothera made more sensitive by the addition of ammonium sulphate is a test for acetone in a dilution of 1 in 20,000, but is a much better test for aceto-acetic acid, as the latter can be detected in a dilution of 1 in 400,000. The ferric chloride test has a delicacy of 1 in 14,000, and Hurtley's test[34] has a delicacy of 1 in 50,000 for aceto-acetic acid. As acetone is only present in urine as a decomposition product of aceto-acetic acid it can hardly be the cause of coma. The evidence for and against aceto-acetic acid and β-oxybutyric acid must therefore be considered.

It was pointed out by Neubauer[35] that when the amounts of acetone bodies excreted were small, more aceto-acetic acid is present than β-oxybutyric acid, but as the total acetone bodies increased the percentage of the β-oxybutyric acid also increased until it formed 70 per cent. of the total. Kennaway[36] was able to confirm this from his results. Hurtley[25] also confirmed it, but preferred to express the results rather differently. He plotted on a table the percentage amount of aceto-acetic acid, which corresponded to each increase of 5 g. of β-oxybutyric acid in 7 cases. As the total acetone bodies increased the percentage of the aceto-acetic acid gradually fell to 30 per cent. or lower, but if the patient was near coma or in coma there was a rise in the percentage amount—in Joslin's case to 54–67 per cent This point was one of several which led Hurtley to regard the aceto-acetic acid as the important factor.

Kennaway[37] has estimated the amount of aceto-acetic acid and β-oxybutyric acid in the blood of 13 patients who had died of coma. The amounts of aceto-acetic acid varied between 53 and 109 mgm. per cent., while the amount of β-oxybutyric acid varied between much wider limits—40 and 215 mgm. per cent.

These results suggest that the aceto-acetic acid is a much more poisonous substance than the β-oxybutyric acid, as the variations in the amount of aceto-acetic acid in the blood are so much smaller than those of the β-oxybutyric acid. Further, Geelmuyden[38] has shown that the liver contains much less acetone and much more β-oxybutyric acid than do the muscles, blood, brain, lung, and kidney. These results certainly suggest, as Hurtley pointed out, that the aceto-acetic acid is converted into β-oxybutyric acid in the liver.

The work of Hurtley and Trevan[39] has done much to establish the view that aceto-acetic acid is the cause of coma. They pointed out that sodium aceto-acetate and the allied compounds, ethyl aceto-acetate, acetyl acetone, and sodium salicylate, all contain the so-called enolic group. (Fig. 5.)

When acetyl acetone was injected into a cat the animal died within 40 minutes with all the symptoms of coma, deep breathing, &c. When any of the above substances were injected into a decerebrate cat with the posterior corpora quadrigemina intact hyperpnœa was produced. They

suggested that the aceto-acetic acid did not produce any symptoms in virtue of its H-ion group, but because of the enolic group $\overset{COH.}{CH}$. β-oxybutyric acid has no enolic group and does not produce this effect. Trevan has continued this work and has shown that when an aceto-acetate is injected into a cat in neutral solution hyperpnœa (or air-hunger), coma, and a fall of blood pressure take place. These results occur, although the reaction of the blood is on the alkaline side of normal. The injection of an acid, such

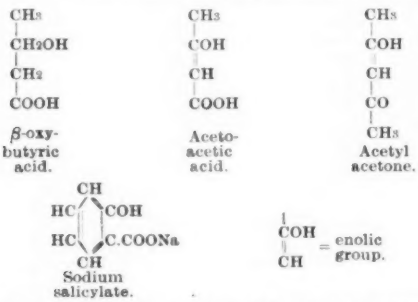


Fig. 5 shows the graphic formulæ of β-oxybutyric acid, aceto-acetic acid, acetyl acetone, and sodium salicylate.

as hydrochloric acid, which will produce hyperpnœa, shifts the reaction of the blood slightly to the acid side. In Trevan's cats there was no decrease in the alkali reserve of the plasma, whereas that is always a marked feature of coma in man. He explains this difference by suggesting that whereas he injected a neutral solution the patient with severe diabetes forms aceto-acetic acid, which has to be neutralised. This work of Hurtley and Trevan, and its extension by Trevan, shows fairly conclusively that the chemical substance which causes diabetic coma is not β-oxybutyric acid, but aceto-acetic acid, and that it produces its effects not by its acid properties, but by virtue of the enolic grouping $\overset{COH}{CH}$. This work explains why the injection of sodium bicarbonate is very unsatisfactory in the treatment of coma. The addition of the sodium bicarbonate adds to the alkali reserve of the plasma, and thus supplies an alkali which will be

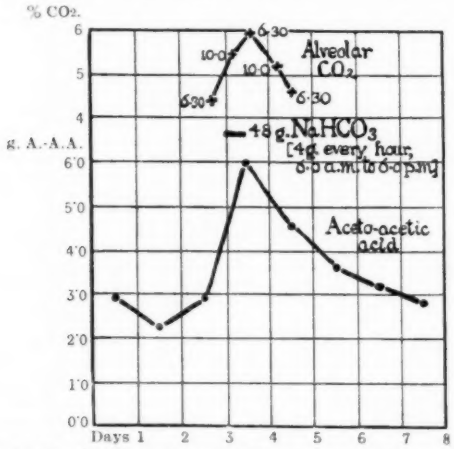


FIG. 6.—Showing effect of 48 g. $NaHCO_3$ on output of aceto-acetic acid and alveolar CO_2.

available to neutralise the aceto-acetic acid. But it cannot influence the poisonous action of the aceto-acetic acid. This is confirmed by an observation of Allen[40] who raised the alkali reserve of the plasma above normal without preventing the death of the patient in coma. It may well be asked whether administration of sodium bicarbonate to such patients is of any use if it cannot neutralise the poisonous effect of the aceto-acetic acid.

I think that it is correct treatment to give sodium bicarbonate to patients who are either on the verge of coma or in coma for two reasons: (1) to raise the alkali reserve of the blood if possible, so as to provide plenty of alkali to neutralise the aceto-acetic acid which is constantly being formed; (2) to enable the neutralised aceto-acetic acid to be excreted more easily. I have made two experiments which bear on this last point. (Fig. 6.)

The first was made in 1915 on a case of severe diabetes who was doing fairly well at that time, as he was only passing 10 g. of sugar a day. The diet was constant throughout the experiment. The aceto-acetic acid output was between 2 and 3 g. a day. On the experimental day 4 g. of $NaHCO_3$ were given every hour from 6.0 A.M. to 6.0 P.M., making 48 g. in all. The aceto-acetic acid output was 6·0 g. on that day and did not return to its original level for another three days. The amount of CO_2 in the alveolar air was determined at 6.30 P.M. on the previous day and was 4·4 per cent.; at 10 A.M. on the experimental day it was 5·5 per cent.; at 6.30 P.M. it was 5·9 per cent. At 10 A.M. on the day after it was 5·2 per cent., but had fallen to 4·6 per cent. by 6.30 P.M. of that day. If no determinations of the alveolar CO_2 had been made it would have been possible to argue that there was an increased formation of the aceto-acetic acid, but, as there was a rise in the alveolar CO_2, it is fairly certain that more aceto-acetic acid was excreted in the urine.

I have repeated this on one other severe diabetic in a different manner. (Fig. 7.)

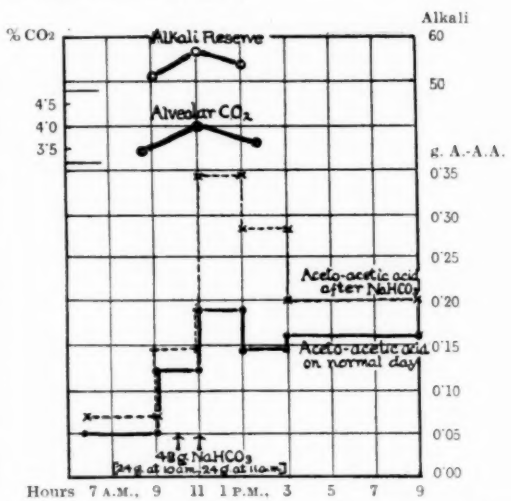


FIG. 7.—Showing effect of 48 g. $NaHCO_3$ on the excretion of aceto-acetic acid, alveolar CO_2, and alkali reserve.

The urine was collected in separate portions from 6 A.M. to 3 P.M. on two successive days. The diet given was identical, but the patient chose to add carbohydrate himself in the middle of the second day. He passed 1·5 g. and 2·6 g. of sugar per hour in the critical periods. The amount of aceto-acetic acid excreted per hour varied from hour to hour on the control day. On the experimental day 24 g. of $NaHCO_3$ was given at 10 A.M. and again at 11 A.M. The amount of aceto-acetic acid excreted was slightly greater, 0·125 to 0·145 between 9 and 11. Between 11 and 1 P.M. there was a much greater output, 0·19 to 0·345 g. From 1 to 3 the output of aceto-acetic acid was rather less, 0·155 to 0·28 g. During the four hours after the sodium bicarbonate, therefore, an extra 0·29 g. of aceto-acetic acid was excreted. The alveolar CO_2 rose from 3·4 at 9 A.M. to 4·0 per cent. at 11 P.M. and had fallen to 3·7 per cent. at 1.30 P.M. The alkali reserve rose from 51 vols. per cent. to 57 vols. per cent. at 11 P.M. and fell to 54 vols. per cent. at 1.30 P.M. The breaking of the diet on this day by the patient was peculiarly annoying, but the addition of carbohydrate is always thought to reduce the acetone bodies and can hardly increase them. The effect in this case is similar to that in the other, but whereas the extra aceto-acetic acid excreted in Case 1 was 3·0 g. on this occasion it was 0·6 g. The alkali reserve was not estimated in the first case but was within normal limits in the second case, and there was no real necessity for the giving of any alkali.

Whether the sodium bicarbonate acts by virtue of its alkaline action or by the fact that it supplies more base is uncertain. Patients have recovered from coma temporarily after normal saline solutions, just as well as after bicarbonate solutions. Allen makes a practice of giving plenty of sodium chloride to his ill patients and it may well be that the base is the important factor which is required. Therefore either sodium bicarbonate or sodium chloride should be

given to cases in coma or on the verge of coma. If the patient is admitted on the verge of coma special attention must be paid to getting the bowels open. The patient should be made to drink plenty of fluid, beginning with one pint every hour, with or without 4 g. of sodium bicarbonate. No food should be given. If the patient is already in coma bleeding should be resorted to, and a big intravenous infusion of sodium bicarbonate or sodium chloride. Estimations of the alveolar CO_2 should be made two or three times a day, preferably by the Hesselbach method, as the patient is often too ill to assist the observer. These estimations enable the observer to form some idea of the severity of the disease and to watch the effect of treatment. If the coma has developed quite early in the disease great efforts should be made to keep the patient alive, as the very acute cases sometimes recover in a surprising manner. Nevertheless, patients in coma usually die.

CONCLUSION.

The account of the ætiology of diabetes which I have given shows how little we really know in spite of the great advance which has been made. Similarly, the treatment has been improved out of all knowledge since 1915, but the disease remains a dread disease. It is true that we prolong the life of the severe cases for several years, and during most of that time the patient feels comparatively well. Yet the treatment is in no sense of the word a real cure. The most that we hope to do at present is to arrest the disease, and in order to do that the dietetic restrictions must be severe and carried out with the coöperation of the patient.

In conclusion, I wish to express my thanks to all those who have helped me, especially to Sir Archibald Garrod for permission to investigate his patients and for much real assistance; to Dr. Hurtley for originally interesting me in this subject and for much assistance with the chemistry of the disease; and to Miss N. Powell, for many years the sister-in-charge of Sir Archibald Garrod's male ward, for her supervision of the patients and the assistance with the details of the diets.

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A MENTAL HYGIENE LEAGUE.—There has recently been formed in France (99, Av. de la Bourdonnais, Paris vii.) a League for Mental Prophylaxis and Hygiene. The League proposes to study problems relating to the prevention of mental disorders and the preservation of a "psychic equilibrium" both in individuals and in groups. The care of mentally deficient children is receiving attention, and the League is also advocating the provision of early treatment clinics. At present these are designed as a part of the organisation of the existing asylums. It may well be that experience will show that they will be more successfully developed in connexion with general hospitals. The League is anxious to be brought into contact with organisations having similar aims in other lands.

THE NON-OPERATIVE TREATMENT OF SURGICAL TUBERCULOSIS.*

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THE following remarks will be confined to tuberculous disease of the bones, joints, and glands, in which conditions non-operative treatment may now be adopted with confidence and a reasonable assurance of success. In certain other non-pulmonary tuberculous lesions—e.g., of the kidney—operative interference still has an essential field, while in such situations as the meninges of the brain treatment of any sort remains almost futile. Operative treatment of an active tuberculous lesion is based on a false pathology, except in cases where the lesion occurs in a situation where its presence is incompatible with life. It is the logical sequence to the "tuberculome" theory of surgical tuberculosis.

Lannelongue showed that the progressive extension of a tuberculous abscess towards the skin was not a mechanical phenomenon, but was the result of primary infection and subsequent excentric destruction of tissues by tuberculous elements advancing much as does a neoplasm. Hence there was evolved a radical treatment which arrived at the total extirpation of tuberculous tissues. This practice, possible and efficacious with small tuberculous foci, exposed the patient to serious danger when applied to extensive bony lesions. The mortality, both immediate and indirect, after major operations was appallingly high, and in the survivors, especially growing children, the extensive mutilations involved produced deplorable orthopædic results. Resection of the hip-joint and excision of the knee often left children sadly crippled, while in spinal caries the situation of the lesions made it usually impossible to excise all the bony tissues invaded by tuberculous disease. Improvements in surgical technique and in asepsis did much to reduce mortality, but even in the latest apology for radical treatment which I have seen, a paper read by Sir Harold Stiles at the annual meeting of the British Medical Association in 1912, the results compare most unfavourably—in spite of the writer's acknowledged pre-eminence as a surgeon—with those obtained by less daring but much safer conservative measures.

To the "tuberculome" theory just referred to the conservative surgeon opposes a theory based on the defensive resources of the patient. A tuberculous lesion provokes a reaction. There is the formation of a zone of resistance about the focus of the disease by the formation of fibrous tissue which encysts, limits, and tends to prevent the progress of invasion. Thus the issue is the result of two opposing forces—the disease which attacks the organism and the reaction which this attack provokes. It appears reasonable to reinforce this natural defence and diminish the virulence of the attack of the bacillus, limiting in this way its progress.

Spread of Conservative Treatment.

Fully to appreciate the change which has arisen in surgical opinion and policy, it would be desirable to sketch the evolution of ideas prevailing during the last 50 years, and such a study is indispensable for a correct appreciation of our views to-day. Time, unfortunately, does not permit that review, desirable though it undoubtedly is. Two reports, however, must be mentioned.

In 1908 Sir Anthony Bowlby demonstrated in the clearest possible manner the undesirability of radical treatment in tuberculous disease of the hip-joint when he delivered an address at Nottingham on 900 cases of tuberculous disease of the hip-joint, treated at the Alexandra Hospital, with a mortality of less than 4 per cent. This paper constitutes a landmark of the highest importance in the history of the treatment of surgical tuberculosis, and I would urge its careful perusal by all interested in the subject. His brilliant record was only possible by abstention from major operations in active tuberculous disease of the hip-joint and aseptic technique in such minor operations as were indicated. The other report to which I would refer is that of a discussion opened by Mr. A. H. Tubby in 1912 at the

* The opening paper delivered before the Medical Society of London on March 14th, 1921.

Royal Society of Medicine, which admirably expressed the more enlightened views lately prevailing, and made it clear that the leanings of surgeons generally were towards conservative as opposed to radical treatment. The value of treatment in the country was emphasised, though even as recently as 1912 the speeches reported at that discussion show that all that is implied by conservative treatment

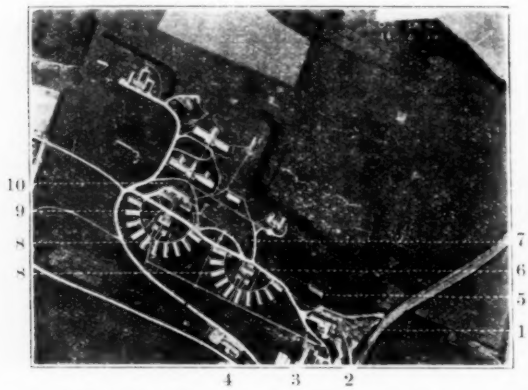


FIG. 1.—Treloar Cripples' Hospital, Alton, from the air. Photograph taken from an aeroplane flying at a height of 4500 feet above the hospital.

1. Hospital private railway station. 2. Power house, workshops, and laundry. 3. Part of college for training of crippled boys. 4. Garage and coach-house. 5. Isolation hospital. 6. Offices. 7. Queen Alexandra Nurses' Home. 8, 8. The 20 wards. 9. Out-patient department and treatment block. 10. The central kitchen.

as I conceive it was still ill-understood. One speaker summarised the position in a sentence: "I look forward to the time when all these cases will be treated until they are well in convalescent homes in the country." I may here be permitted to interpose, that it is just these ill-equipped, inadequately staffed, and inefficient country homes which have done so much to discredit conservatism in treatment. Much more is required than they can supply, as I hope to show presently, and the hope for these patients in the future lies in up-to-date, well-equipped, properly staffed, efficient country hospitals as part of the scheme for the treatment of sufferers from surgical tuberculosis. It may not be without interest to recall that no inconsiderable part

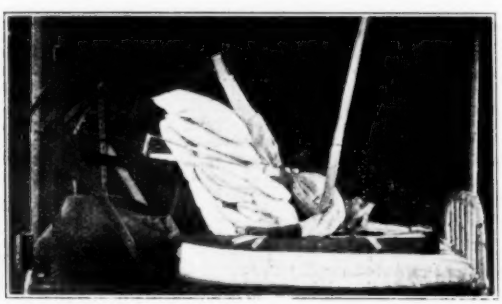


FIG. 2.—So-called Marconi apparatus for correction of extreme deformity in tuberculous disease of the spine. The compensatory curves in the spinal column of the patient to be treated on this apparatus are first straightened; the angular curvature can then be most effectively treated mechanically by traction on the head and pelvis and pressure on the deformity. Great care must be exercised, but extreme deformity is correctible or reducible by this method unless too firm ankylosis has taken place.

of the discussion was devoted to tuberculin treatment. Clinicians were then by no means greatly convinced of its value, nor does there appear to be an appreciable change in their attitude towards tuberculin to-day.

One point of great importance came out clearly: "tuberculous joint disease is arthritis occurring in a tuberculous patient, and is not merely a joint affection." This is the keynote of, and justification for, non-operative treatment of surgical tuberculosis. It needs the greatest possible emphasis, for even to this day there is too great a tendency to concentrate unduly on the local lesion and disregard the fact that the patient himself has contracted a general disease, of which any particular lesion or lesions are merely local manifestations.

Present Uses of Pure Surgery in Bone, Joint, and Gland Tubercle.

The title of this paper is perhaps hardly a satisfactory one. Pure surgery still plays a part in the treatment of bone, joint, and gland tubercle, though in cases of active disease a continually diminishing part.

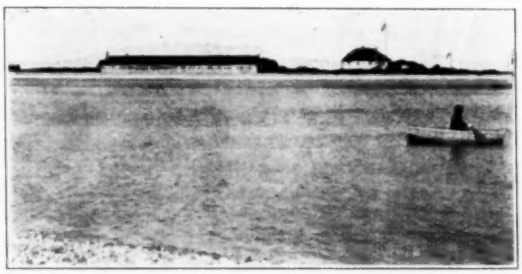


FIG. 1A.—Treloar Cripples' Hospital, Hayling, from the sea. Note the flat littoral, extensive beach, the proximity of the Pavilion to the sea, the absence of anything which could interfere with marine treatment. In addition, the situation has been carefully selected because of the bracing but equable marine climate, clearness of atmosphere and absence of mist, remoteness from rivers, abundant sunshine of high actinic value aided by the reflected light from the sea, protection from cold winds by the South Downs on the north, peculiarly low rainfall owing to physiographical conditions, sandy absorbent soil, remoteness from towns and absence of interference by seaside visitors, extensive beach in relation to area of land purchased, &c.

It is often justifiable in the extirpation of the smaller tuberculous lesions; it is occasionally permissible in such conditions as tuberculous disease of the knee-joint in adults where progress by conservative measures is slow and the time factor is of importance; it may be essential for the saving of life under increasingly rare circumstances in almost any situation of the body. It is again indispensable in the correction of ankylosed or other deformities where faulty initial treatment has permitted such deformities to arise—e.g., a hip-joint ankylosed in a bad position. It may be called for where faulty technique has resulted in secondary infection. But no striking advance has been made in the operative treatment of acute tuberculous bone and joint disease unless bone grafting of the carious spine be considered as such. That operation is, however,

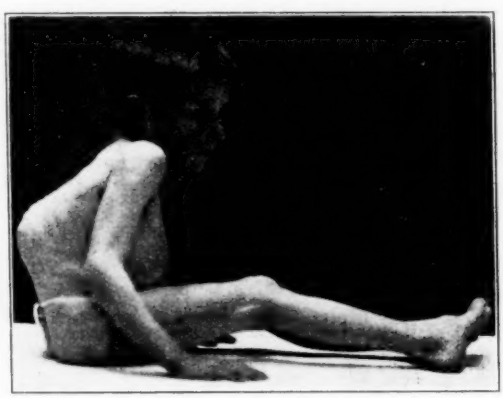


FIG. 3.—Patient suffering from extreme angular curvature of the spine, the result of tuberculous disease.

essentially a conservative measure. No attempt is made to deal with the lesion which calls for such an operation. It is simply an internal method of splinting the spine, designed as a substitute for the instrument maker's skill. In the majority of cases it is an unnecesssary operation provided reasonable facilities are available for treating the patient; in certain cases it has distinct and considerable dangers; in a limited number of cases it presents certain advantages. It possesses one point in its favour in that it is a conservative operation; it is a tangible if tardy recognition of the fact that to immobilise a tuberculous lesion is a better way of promoting healing than to attempt its extirpation; but with increasing appreciation of the value and utilisation of properly applied conservative treatment the indications

for the performance of this operation should be greatly reduced, to the advantage of the patient. I would appreciate the operation more if it made cure certain where a purely non-operative method of treatment would have failed; but I cannot conceive that it would have saved the life of any one of my spinal caries cases who have died. It would have increased my mortality if generally adopted, and I think I can demonstrate that it would have made little appreciable difference in the length of treatment required.

Definition of Conservative Treatment.

The title "non-operative treatment" of surgical tuberculosis conveys no suggestion as to what the treatment if non-operative may be. Treatment, where operation is avoided in these conditions, is usually termed conservative. This term again is open to criticism. What is the conservative treatment of surgical tuberculosis?

As usually understood it conveys no very exact meaning. By some it has been confused with convalescent treatment, but there is a period of convalescence in the natural history of the disease in a patient whether he be treated conservatively or radically. Others regard conservative treatment as treatment without operation, but have no very clear ideas of what should be substituted for operation. May I explain what I understand by conservative treatment? I would define conservative treatment in surgical tuberculosis as the adoption of all measures which tend to improve the patient's general health, increase his powers of resistance to tuberculous disease, and preserve or restore the part or parts attacked, in contradistinction to radical treatment, which aims at the cure of the disease by the removal of the local lesion. It will be evident that such a definition is the very antithesis to lack of treatment, that it necessitates the employment of very active, numerous, and complicated methods, that it by no means necessarily implies exclusion of surgical interference, although surgery from being the one treatment becomes relegated to a very inferior but still useful position, as a possible aid to cure or amelioration under certain conditions. Moreover, I would give it a wider meaning than mere institutional treatment, and would not confine conservative treatment even solely to the application of merely medical or surgical care. There are means of improving the patient's condition, additional to those directly derived from the arts and science we practise, which possess an importance we have been slow to recognise. Chronic disease, which must of necessity involve lengthy treatment, has for too long been regarded from the purely pathological point of view. For this error blame must be ascribed to both the practitioner and the public. The former has narrowly concentrated on his own particular duties and disregarded the wider issues. The public has been content to leave the matter to the practitioner, and the intellectual and industrial aspect of the problem has been utterly ignored. The psychology and future well-being of the patient have been neglected, yet no one would deny their importance. A normal, healthy, well-cared-for, suitably occupied child is a happy child. He is given full play for natural healthy mental and physical activities. Conversely, it is of obvious assistance to the patient to make him happy and normal, and all means to that end should be encouraged and utilised. The monotony of immobilisation, of long-enforced recumbency, of fixation in unnatural attitudes cries for alleviation. Consider what such unnatural restrictions would mean to us, who have so many resources of our own to fall back upon, and what they must be when uncompensated. This state of affairs should have been remedied long ago.

FIG. 4.—Same patient as Fig. 3, with the deformity largely reduced after treatment on the "Marconi." Further reduction of the deformity can now be obtained by using the "swinging back-door splint." (See THE LANCET, 1911, i., p. 568, Mechanical Treatment of Tuberculous Disease of the Spine.)

I may not pause to explain in detail how, but shortly, all child patients should be educated, and manual instruction should play a large part in the scheme, adolescents trained in work suited to their limitations, and adults occupied. In addition, all should be amused and entertained, and shown how to amuse and entertain themselves. The institutions at Alton and Hayling have been called the "happy hospitals." The secret of that happiness lies in the fact that the patients are as busy, as occupied, and therefore as happy and as contented as the staff. To assist in carrying out this part of the work we employ, on the educational side 14 trained teachers, and on the technical 5 trained instructors. This should be an essential branch of conservative treatment in every special institution for surgical tuberculosis.

5 6 7

FIG. 5.—Tuberculous disease of the hip-joint with marked flexion and adduction.
FIG. 6.—Same patient photographed from above. This is a case of right-angled adduction, the most difficult deformity to correct in tuberculous disease of the hip-joint.
FIG. 7.—Same patient: treatment completed and deformity corrected.

Need for Prevention.

In any comprehensive scheme for the treatment of surgical tuberculosis prevention should play a much greater part than hitherto.

Much more should be done than is being done for the child with the stigmata of tuberculosis, the pre-tuberculous child, the offspring of tuberculous stock. I would advocate the establishment of properly equipped preventoriums where such children could have the benefit of preventive treatment under the best climatic, hygienic, dietetic, and educational conditions, and under skilled supervision. Such a preventorium is in contemplation at Alton, where it is anticipated it will be of especial value as demonstrating what may be accomplished on these lines. Non-residential open-air schools meet these needs to some extent, but they are necessarily imperfect, for the child returns nightly to unfavourable conditions.

Conservative Treatment of Tuberculous Abscesses of Bony Origin.

Conservative treatment includes consideration of general treatment, involving climatic, hygienic, dietetic, drug, educational, and other methods which it is desirable to employ, and local treatment, which is concerned with the correction or prevention of deformity and is largely orthopædic in character, but subject to those limitations enjoined by the fact that the patient is tuberculous. Under this heading may also be included those surgical measures which have still a place in treatment. To only one shall I here allude, and that is to the conservative treatment of tuberculous abscesses of bony origin.

I would state as a rule, to which there need scarcely be any exception, that tuberculous abscesses secondary to disease of the spine, hip, or, indeed, any of the larger bones or joints, should never be opened. Neither should they be left in the hope that they will be absorbed. As soon as

FIG. 8.—Tuberculous disease of the knee-joint, with subluxation of the tibia and sinus formation.

FIG. 9.—Same patient as Fig. 8 after treatment. Deformity corrected, sinus healed, movement returned to joint.

possible after their formation and as early in their evolution as the skill of the surgeon permits they should be aspirated. Occasionally their aspiration may be assisted by the employment of modifying fluids. The technique and arguments for the selection of this form of treatment, I, with my friend Dr. Jacques Calvé, have already fully detailed.

FIG. 10.—Tracing of skiagram of knee-joint of patient (Figs. 8 and 9 before treatment.

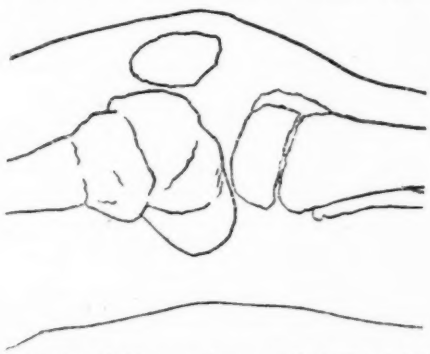
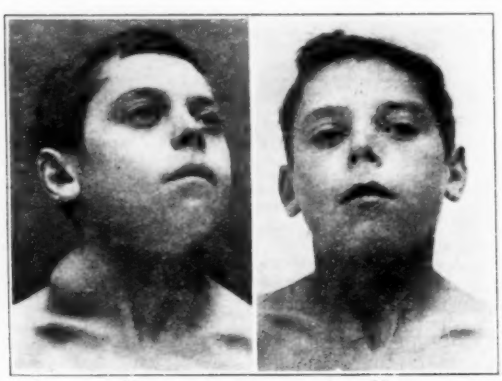


FIG. 11.—Tracing of skiagram of same patient (Figs. 8, 9, 10) after treatment.

One point, often disregarded, is that the method of healing of a tuberculous abscess successfully aspirated is essentially different from that of a similar abscess which has been incised and has proceeded, as so often it does, to sinus formation. In the former case healing is centripetal, in the latter centrifugal. In the abscess skilfully aspirated the fluid contents are withdrawn, the abscess wall collapses, becomes denser, shrinks towards the causative lesion, continues to protect the organism from further spread of the disease, and becomes in time a mass of protective tissue, which gradually absorbs when no longer required. Incision of an abscess, on the other hand, necessarily increases the risk of dissemination of disease, and leaves a comparatively weak cicatrice probably infected with tubercle bacilli, which often tends to break down, perhaps years afterwards. Sinus formation then ensues, secondary infection frequently follows, healing is delayed and occurs in the reverse order to that succeeding aspiration—viz., from the causative lesion to



12 13

FIG. 12.—Tuberculous gland of the neck.
FIG. 13.—Same patient after aspiration.

14 15

FIG. 14.—Patient suffering from multiple tuberculous lesions with much toxæmia. The lesions included cervical adenitis, tuberculous iritis with photophobia, tuberculous disease of hip-joint and lupus.
FIG. 15.—Same patient after treatment. All lesions healed, general condition good, movement has returned at hip-joint; there is no deformity.

the surface. I do not think that anyone who has acquired skill and any considerable experience in the aspiration of tuberculous abscesses would ever willingly revert to their evacuation by incision. (See Figs. 21, 22.)

Adjuvant Treatment and Auxiliary Methods.

Adjuvant methods of treatment have largely increased in relative importance and scope of application in recent years, and represent perhaps the most interesting advances made in the non-operative treatment of surgical tuberculosis.

Amongst such aids are heliotherapy, balneotherapy, chemotherapy, vaccine treatment, and the therapeutic employment of X rays and other electrical agents. Auxiliary methods are of importance for the patient's general well-being, and are also often directly concerned with his disease; they comprise attention to the teeth, skin, throat, nose, ears, and eyes. These matters are frequently neglected, but demand attention and skilled care. I should also include under auxiliary methods of treatment a branch institution such as we are fortunate in being able to make use of, where chronic cases not requiring any special treatment may be detained indefinitely, and thus give room at the hospital for more acute patients urgently needing specialised care.

After-Care.

Lastly, I would touch on the all-important matter of after-care.

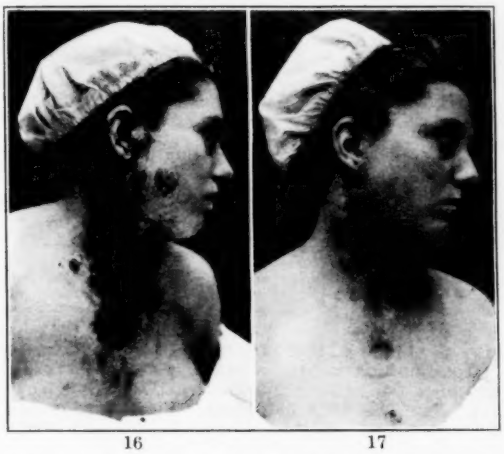
All patients who have suffered from surgical tuberculosis should have the continued advantage of occasional skilled supervision. No special hospital for the treatment of these conditions can be considered complete unless it possesses an out-patient department where discharged patients may be periodically examined, advised, and assisted. Not only is medical help required, but advice in the choice of occupation and assistance in obtaining suitable employment should be

FIG. 18.—Sun balcony at Sandy Point, Hayling Island. Canvas blinds can be pulled down over the patients to protect them from showers or excessive sun, and canvas weather screens can be lashed to the uprights shown, to afford shelter from too strong winds.

forthcoming. Associated with this department facilities are necessary for sending patients to open-air camps and holiday homes working in conjunction with, and under the management of, the parent institution. Many discharged patients at some time or other need such "toning-up" as these offshoots from the hospital can supply. Some cachectic cases, indeed, though not suffering from active tubercle, urgently require prolonged detention in residential open-air institutions, with the possibly ultimate transference to a residential technical school, such as the college for permanently crippled boys we maintain at Alton. Here lads between the age of 14 and 18 are admitted, detained for three years, trained in a trade suited to their limitations, and continue their general education during this period of training.

Conclusion.

All the methods of treatment I have just indicated are undertaken at the Treloar Cripples' Hospital and College at Alton and Hayling Island, and it is on experience gained there that I base my remarks. There is great hope for the future. The treatment of surgical tuberculosis has now aroused lay as well as medical interest. Active Government measures are being taken



16 17

FIG. 16.—Extensive lupus which had resisted treatment for seven years.

FIG. 17.—Same patient after chemotherapeutic and heliotherapeutic treatment. The scars remaining are the result of scraping operations performed previous to admission.

to combat the disease. Municipalities are devising schemes of their own under expert advise and with Government subsidy. If the spirit of the voluntary institutions can be maintained this is all to the good. Many medical men are exerting their powerful influence to promote reform. Prominent amongst these I would

FIG. 19.—Ambulant patients at Hayling Island enjoying sun, sea and sand—valuable adjuncts to the cure.

mention Sir Robert Jones, long a distinguished practitioner of conservative treatment, who advocates orthopædic centres in every locality. The desirability of associating cases of surgical tuberculosis with general orthopædic work may be criticised, but every medical man will support and sympathise with the efforts he is making. My experience is that it is quite fallacious to suppose that adults do not respond well to conservative treatment. It is of equal importance in adult cases of tuberculous disease, and yields equally gratifying results, although with adults there may be a more frequent necessity for operative aid.

I have contented myself by referring simply to the general principles underlying the conservative treatment of surgical tuberculous affections. It is a method involving minute attention to detail. Any individual case may require the application of numerous measures appropriate to its peculiar requirements and varying according to the stage of the disease or even to the idiosyncrasies of the patient. To discuss these various forms of non-operative treatment summed up in the word conservative, the indications for their individual or combined employment, the extent to which they may

FIG. 20.—Patients suffering from spinal caries on specially designed spinal stands receiving sun treatment at Alton. All patients are educated while receiving treatment, and the illustration shows a teacher giving instruction while insolation is proceeding.

be usefully adopted, the effects which they separately or in combination produce, and the ultimate results which may be reasonably anticipated, is obviously impossible. The final judgment to be passed on any method of treatment must depend on the end-results achieved. Accordingly, I would refer the reader to the accompanying illustrations and tables of results, which will convey more graphically than any words the significance and value of conservatism in the treatment of surgical tuberculosis.

Table I. gives an analysis of results of treatment of patients suffering from surgical tuberculosis at the Lord Mayor Treloar Cripples' Hospital, Alton, Hants, from the opening of the hospital in September, 1908, to Jan. 31st, 1921.

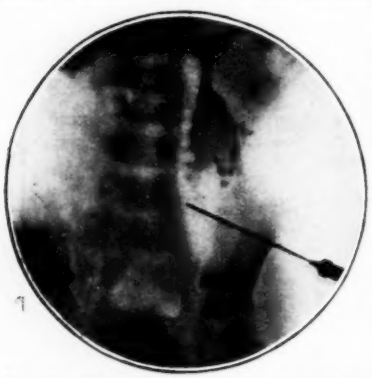


FIG. 21.—Skiagram (taken from below) of a spinal abscess containing liquid, caseous and calcareous pus, taken whilst being aspirated. The pus was liquefied by the injection of modifying fluids. Note the cannula in the abscess cavity.

Cases sent in as tuberculous but ascertained after admission not to be suffering from tuberculous disease—e.g., pseudo-coxalgia sent in as tuberculous disease of the hip-joint—are not included in Table I. Patients are classified according to their principal lesion. A very large number were suffering from, and in some cases developed during treatment, other or multiple lesions. In these statistics no mention is made of septic cases. The proportion of septic cases admitted is, unfortunately, a high one. The majority of those discharged unimproved were septic cases. By "disease arrested" is meant that the disease appears to be cured, abscesses are absent, sinuses healed, and the patient fit to return home and resume ordinary life, not under continuous supervision, but advised, where feasible, to report to our London out-patient department periodically for observation. Patients removed are those withdrawn by parents or guardians before the disease is arrested. Patients transferred include boys transferred direct to the College for technical training, or to an auxiliary home for protracted treatment. No death has occurred in the College. A certain number of patients have also been transferred to other institutions who required treatment of other conditions more urgently than continued treatment for surgical tuberculosis.

TABLE I.—*Results of Treatment.*

Lesion.	Admissions.	Discharged.	Disease arrested.	Improved.	Unimproved.	Removed or transferred.	Died.	Average stay in days.	Mortality percentage.
Spine	920	810	674	22	24	68	27	503·2	3·39
Hip	880	768	710	18	2	25	13	403·1	1·71
Knee	333	304	282	6	—	11	7	334·7	2·3
Other	354	315	265	16	5	19	9	259·8	2·8
—	2487	2197	1951	62	31	123	56	416	2·54

FIG. 20A.—Ambulant patients leaving the wards for nature study and sun treatment at Alton.

It will be seen from Table II. that if we exclude patients who died from intercurrent disease the number of deaths directly due to tuberculous disease is reduced to 47, or barely over 2 per cent. of patients discharged. While meningitis is the commonest terminal cause of death, a certain number of these cases were septic as well as tuberculous, and I would regard secondary infection as the most serious complication which may arise. It may almost always be avoided if non-operative treatment is undertaken. Spinal caries is not only the commonest, but also the most fatal form of surgical tubercle admitted. It is noteworthy that 10 of the 13 patients suffering from spinal caries who died of meningitis were under the age of 5 years, and in many cases death occurred within a comparatively short time after admission. Contrary to what is frequently assumed by the public, surgical tuberculosis is more difficult to treat, more likely to produce considerable physical disability, and undoubtedly more fatal in the very young than in older children. Of all bony lesions the one I regard as most dangerous is tuberculous disease involving the flat bones of the skull.

FIG. 22.—The same case later. All that is left of the abscess is the small particle of calcareous pus indicated by the white line at A. (Skiagram taken from above.)

TABLE II.—*Analysis of Mortality Statistics.*

Cause of death.	Spine	Hip	Knee.	Ankle.	Multiple.	Other.	Total
Meningitis	13	6	4	2	—	1	26
Sepsis	8	6	1	—	2	1	18
Miliary tubercle	1	—	—	—	1	—	2
Cerebral abscess	1	—	—	—	—	—	1
Intercurrent	4	—	3	—	1	1	9
—	27	12	8	2	4	3	56

SPINAL CARIES IN CHILDREN.

A METHOD OF FIXATION.

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THE appliances most generally used in this country in the treatment of spinal caries in an active stage are, so far as one can judge from the cases admitted to Queen Mary's Hospital, Carshalton, the Whitman stretcher, the double Thomas splint, the Berck tray, the plaster bed and the recumbent plaster jacket, and less commonly the spinal board, the Bradford frame, and the Phelps box. All these have features which recommend them, and all have imperfections the importance of which is more readily realised when the disease is treated on a large scale, as it is at Carshalton.

Drawbacks common to all are that the straps and buckles which restrain the patient are within his reach; thus recumbency is often by no means complete, and supervision may become a constant strain. While the spine is being treated other parts of the body are apt to suffer from the immobilisation; the chest often becomes flattened, and if the patient is long recumbent considerable wasting of the muscles of the lower limbs occurs from disuse, and the knee-joints may become lax and over-extended. In some cases there is slight contracture of the tendo Achillis owing to dropping of the feet, even though a cradle has been used to take away the weight of the bedclothes. The resulting inability to dorsiflex the ankles beyond the right angle produces for a time an awkward gait, and may lead to some degree of talipes valgus. Another drawback met with in some appliances is that there is no satisfactory arrangement for the use of the bedpan; further, portability is often limited, and even the more portable appliances are not very convenient to move more than a short distance.

Apparatus Used at Carshalton.

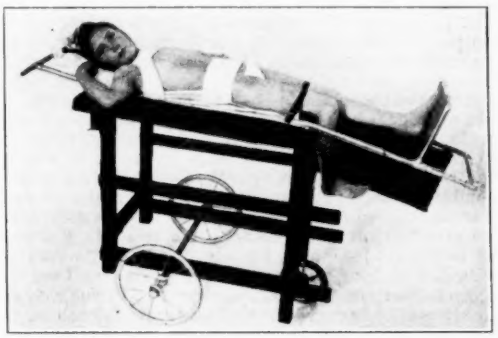
The apparatus which I use at Carshalton is a frame which rests on a carriage of simple design; the latter is not essential to the frame, which with its head end resting on a block acts equally well on a bed.

The frame, like the Whitman stretcher, is made of gaspipe and is generally eight or ten inches longer than the patient; it has a flat transverse bar opposite the shoulders and a padded one just above the knees. It is slightly narrower than the distance between the iliac crests, but from the lower part of the thighs is cranked out an inch and a half on each side to allow of more freedom of movement for the legs. It may be conveniently described from the foot upwards. An adjustable felt-lined foot-rest prevents the feet from dropping, and a bend in the frame at the level of the knees allows the latter to assume their natural position of rest in slight flexion. The thighs at their lower end rest on the padded crossbar to which knee-straps are attached by means of a saddler's D. (Fig. 2.) The legs lie on a felt-covered wooden flap, which can be dropped at suitable intervals to allow of active exercise of the thigh and leg muscles, the separate strap over each knee ensuring that this movement takes place without disturbance of the spine by the psoas. (Fig. 1.) To avoid the foot-rest when raising the legs the child has to dorsiflex his feet and thus a full range of movement at the ankle-joint is maintained. A flap beneath the buttocks allows of the use of an enamelled tray, 10″ × 7″ × 3,″ as a bedpan; if the frame is on a carriage the tray is suspended from the tubing by a special holder, otherwise it rests on the bed. (Fig. 2.) This flap, three or four inches wide, is made of duralumin; one border is curled closely round the tubing and serves as a hinge; the free end rests on a flat catch inserted in the tubing, and has a slot through which the catch slips if rotated, and thus the flap can be made to drop. If a child has enuresis the enamelled tray may be left under him with the flap in position to support the buttocks, and wetting of the bedding may in this way be avoided.

The "apron" consists of two transverse pieces of crash towelling connected by a duralumin rod on each side. The chest-piece is shaped to avoid the neck and sends a process over each shoulder, which ends in a webbing loop; at the side it passes beneath the armpit to end in a narrow pocket or hem in which the rod fits. The pelvis-piece which ends in similar pockets runs across the lower abdomen not extending lower than the level of the top of the intergluteal fold, which is the upper limit of the duralumin flap beneath the buttocks. Through slots in the shoulder bar and three holes in each connecting rod the apron is laced behind the frame with blind cord, the ends of which are tied to the foot of the frame out of the patient's reach. Compression of the front of the chest is thus avoided, although some flattening of the ribs behind may occur when a child is kept lying for a prolonged period.

If the prominence is moderate and not sharp the child can, as a rule, lie on a crash or leather cover, conveniently made taut by inserting duralumin rods in the side hems and drawing these together with a couple of webbing straps beneath the frame, which is bent at the hump to secure

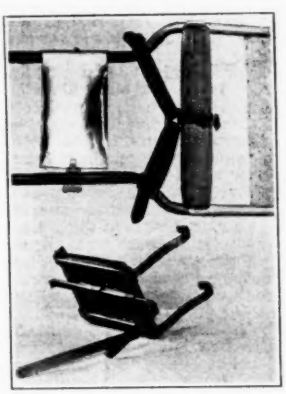
FIG. 1.



hyperextension. If the prominence is marked or so sharp that the skin is likely to be injured the child is made to lie on a thin plaster bed instead of a cover. The plaster bed is readily made by placing the child on his face in the hyperextended position and running plaster bandages up and down over the back between the scapular spines and lower sacrum, subsequently strengthening the bed with celluloid solution. Several inspections of the back are advisable during the first week, but after that it is unnecessary to remove the patient more often than once a month, when the opportunity is taken of placing a few squares of Gamgee tissue beneath the prominence with a view to a gradual correction of the deformity. As the correction obtained calls for it a new plaster bed is made.

In high dorsal caries the frame is bent backward instead of forward at its upper end and the plate on which the head rests is domed downwards to allow of hyperextension; in cervical caries a leather collar is added to prevent rotation of the head. The children are provided with hand mirrors so that they can observe what is going on around them. Between head-plate and shoulder-bar there is a clear interval through which crumbs can fall.

FIG. 2.



Showing buttock-flap, knee-bar, and pan-holder (from below).

The carriage is short, extending only from the shoulders to the knees; it is 30 inches high and consists of four deal uprights joined by side and end rails; it is supported by wheels, and hinged to it on each side is a narrow table on which the child rests his arms and places his toys, school books, or eating utensils. The clothing consists of vest and nightgown open at the back along their whole length, and between them a jersey open behind to within 3 inches of the neck. In mild weather stockings are worn, but in winter the legs are enclosed in a bag made of old blanket material; a broad binder is wrapped round the pelvis and thighs and a waistcoat shaped to enclose the shoulders round the chest, both being made of the blanketing and enclosing the frame. A cot sheet, blankets, and counterpane complete the bedding. No difficulty has been experienced in keeping patients thus equipped out in the open air on their carriages day and night throughout the winter months. The frame can be readily unclamped from the carriage for transference to a bed.

Although somewhat complicated for purposes of description the apparatus is not difficult to measure for, make, or apply. It is made in the hospital workshop at a cost which compares favourably with that of several less effective appliances. With slight modification it is used in the treatment of hip disease.

THE ACTION OF DIGITALIS AND ATROPINE ON THE PERIPHERAL BLOOD PRESSURE.

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IN this paper the action of digitalis and atropine on the peripheral circulation has been studied, and from the relation between blood pressure and pulse frequency certain deductions have been made with regard to the influence of these drugs on the general circulation. The leading idea of the paper is to make the output of the single contraction a sort of criterion by which the effects of these drugs are to be gauged. It is assumed that a large systolic output will give rise to a correspondingly large pulse-pressure reading and vice versa. (The duration of the systole is taken into consideration.) The observation was conducted at the heart clinic of the Northern Hospital, Liverpool. Digitalis was prescribed, and blood pressure and pulse tracings were taken before the administration of the drug and once weekly whilst the patient was under its influence.

Procedure with Atropine.

With atropine the following procedure was adopted. The drug was administered hypodermically, the blood pressure and a cardiogram being taken before and half-hourly after administration. In some cases continuous polygraphic tracings were taken for from an hour and a half to two hours while the patient was under the influence of the drug.

Method of observation.—The combined palpation and auditory method was used to determine the systolic pressure, whilst for the diastolic I depended on the auditory method alone.

Systolic pressure.—Until a few years ago, it was generally assumed that digitalis increased the arterial blood pressure even if administered in therapeutic doses. More recently it has been observed that digitalis given in therapeutic doses does not increase the pressure. My experience was as follows: Soon after digitalis was administered an increase of pressure took place in the majority of cases, lasting a comparatively short period, after which it gradually fell, reaching a level considerably lower than before the administration of this drug. In some instances the declining curve does not show a straight downward line, but here and there a sudden rise is observable. This is often found in cases where digitalis has been administered for a lengthy period.

Diastolic pressure.—The gradual fall of the diastolic pressure owing to the action of the drug is far more pronounced than has been the case with the systolic. Now and then a slight increase is observable immediately after the administration of digitalis, or even in the latter stages, in cases where the systolic increase is pronounced. As a rule, however, digitalis effects a gradual decline in the diastolic pressure from the very commencement.

Pulse pressure.—The pulse-pressure curves show in the majority of cases a tendency towards an upward movement for a considerable time, after which they begin to decline. The pulse pressure continues to increase at a time when both the systolic and diastolic pressure are on the decrease; the two latter pressures may fall considerably below the level at which they have been before the administration of the drug, yet the pulse pressure may continue to rise.

Pulse-rate.—Soon after the administration of digitalis the pulse-rate often becomes lower, but later on for a longer or shorter period it keeps on very much the same level as before the administration of the drug, after which it becomes accelerated. Whilst it is true that soon after the administration of digitalis the systolic pressure is often raised and the pulse frequency diminished, no absolute interdependence between these two factors is demonstrable. In some instances a slowing of the pulse-rate is observable without any corresponding increase in blood pressure, and vice versa.

Relation of pulse pressure to systolic pressure and pulse frequency in hearts unaffected by drugs and those under the influence of digitalis.—In hearts unaffected by drugs the pulse pressure and pulse frequency stand, as a rule, in a definite relation to the systolic pressure. The higher the systolic pressure the higher the pulse pressure and vice versa. Thus in a typical case of senile heart the systolic pressure is raised and pulse pressure is correspondingly high, whilst in the normal heart, or in uncomplicated mitral disease, the systolic pressure is not raised and the pulse pressure is small. The pulse-rate, too, more often than not bears a certain relation to the systolic pressure in hearts unaffected by drugs. As a rule, a low pulse frequency is accompanied by a high pulse and systolic pressure, and the duration of the systole bears a certain relation to the pulse pressure, a long systole being generally correlated to a high pulse pressure and vice versa. The systole in a senile heart or in heart-block is distinctly longer than in a normally beating heart, and the pulse pressure is correspondingly high in these instances. These relations are completely altered by the action of digitalis. Under digitalis we often find a high pulse pressure in conjunction with a high pulse frequency, a short systole and a low systolic pressure.

Atropine: Action of atropine on cases unaffected by other drugs.—Within half an hour after the hypodermic injection of 1/100–1/75 of a grain of atropine, in the majority of cases under observation, the systolic pressure fell and the pulse pressure became diminished; the diastolic pressure, too, fell, but to a lesser degree than the systolic, and the pulse-rate became lower. Usually, as we have seen, a low pulse-frequency is correlated to a high systolic and pulse pressure. Under the influence of this drug, in doses indicated above, both these pressures became low.

Action of atropine on cases previously under the influence of digitalis.—In all essentials the effect of atropine in doses indicated above is the same whether the patient has been under the influence of digitalis or not. The systolic and pulse pressure become lower and the pulse frequency also becomes lower. If the pulse frequency has increased owing to the action of digitalis, the administration of atropine will considerably lower the pulse-rate. Similarly under atropine any cardiographic evidence of digitalis poisoning which may be present will disappear.

Action of atropine in doses of 1/50 gr.—Atropine in doses of 1/50 gr. increases the pulse frequency, the systolic pressure becomes lower under its influence and the pulse pressure diminished.

Contrast in effect of digitalis and atropine action.—Under digitalis a high pulse pressure is found in conjunction with a high pulse frequency, a short systole, and a low systolic pressure. Under atropine in doses of 1/100–1/75 gr. a low pulse pressure is correlated to a slow pulse with a relatively long diastole and a low systolic pressure.

Discussion.

We have seen how, after a comparatively short period, the systolic pressure falls and the pulse pressure increases. The fall of the former is obviously due to the low diastolic tension, which we have seen is one of the characteristic features of digitalis action. Now, the pulse pressure represents the output of a single systole; a high pulse pressure therefore means a correspondingly large output (the duration of the systole being taken into account). As the pulse frequency is not diminished but often increased, it follows that the total output of the heart per a given time is increased under digitalis. Even where the pulse pressure is not increased, since the pulse-rate is often increased, the total output would still be greater than normal.

Abnormal Lowering of Systolic and Diastolic Pressures.

The question now arises, Why are the systolic and diastolic pressures lower than normal when they ought to be higher, since the arteries receive more blood into them from the ventricles per given time than before the action of digitalis becomes effective? There are two possible explanations of this apparently paradoxical phenomenon. It is conceivable that dilatation of the arteries might cause a fall in the systolic pressure, although the total amount of blood they contain is increased. This does not seem a very plausible explanation. First of all, there is no evidence that under the influence of digitalis dilatation of the vessels takes place; on the contrary, all evidence points the other way. Digitoxin contracts all vessels, whilst digitalin contracts the vessels of the abdominal organs and dilates the vessels of the extremities[1]; the action of digitalis accordingly cannot result in fall of pressure, owing to dilatation of the arteries. Moreover, if dilatation of the vessels were the correct explanation of the fall of pressure under digitalis, it would still have to be assumed that with the increased output which the drug effects the blood accumulates on the side of the arterial circulation. This is an improbable assumption. Whence does the heart derive the blood for an increased output? From the reserve volume which remains normally in the ventricles after systole? This would soon be exhausted. From the veins? On the one hand we are supposed to have a piling up of blood on

[1] Cushny: The Action of Drugs.

the arterial side; on the other hand, we have an ever-increasing output of the heart, the supply of which can only be derived from the veins. In other words, the veins, relatively at any rate, would receive less blood from arteries and give up more than is normally the case. Such double factors acting even in inconsiderable quantities would in a very short time completely empty the veins of their contents, when one considers the number of beats per 24 hours, and the fixed quantity of blood contained in the circulation. The theory that digitalis takes blood from the veins and piles it up on the arterial side seems to be accordingly untenable; it is extremely unlikely that the fall of pressure under digitalis is due to dilatation of vessels.

There is only one alternative explanation. The flow of blood in the vessels might take place at an accelerated rate owing to the influence of digitalis. Under these circumstances it is conceivable that the blood might leave the arterial system at a quicker rate than is normally the case. The increase of the output of the single contraction might not compensate adequately the accelerated rate of outflow of the fluid from the arteries. The total amount of blood contained in the arterial system per given time would accordingly be less than normal. The diastolic pressure would become low under such conditions, and incidentally also the systolic.

Increased Heart Content of Blood Caused by Administration of Digitalis.

That the flow of blood under the influence of digitalis is accelerated has long been proven.[2] But now comes the most interesting feature of the whole problem. A given volume of fluid which circulates in a closed system at the same rate at every part will contain exactly the same amount of fluid in all its parts per given time, whether the rate of flow is slow or quick, since the volume of fluid which leaves one side of the system is replaced by exactly the same amount of an inflow from the other. If the total quantity of blood per given time is to be diminished in the arterial system owing to the accelerated rate by which the outflow takes place, it must be assumed that the inflow takes place at a slower rate or in a decreased volume. This would presuppose that at another part of the circulatory system the quantity of blood is greater and the pressure higher than normal.

Which part of the circulation is thus affected? Not the venous side of the circulation to be sure. A cursory glance at the veins of a patient who is under digitalis is sufficient to convince oneself that the pressure in them is not increased and that the quantity of blood they contain is not larger than normally. We are driven to the conclusion that the only part of the circulatory system which could possibly contain a greater quantity of blood than normal owing to the influence of digitalis is the heart. As a matter of fact, the following consideration will show that it could not be otherwise. Supposing that under the influence of digitalis the pulse-rate, as it often does, remains the same as before the drug has been administered, the duration of diastole, to put it at the lowest—indeed, the duration of all phases of the heart—is the same under digitalis as before. But the flow of blood is accelerated. In the same time unit the heart will receive a greater quantity of blood than before the action of the drug. On the other hand, the outflow from the heart is not accelerated, since, as we have seen, the diastole in this instance remains of the same duration. The heart, therefore, will contain at the beginning of the systole a larger quantity of blood than under normal conditions. It is true, too, the output per single contraction is increased. It is also possible that soon after the administration the total amount of blood on the arterial side is increased. It is more probable, however, that the total amount of blood in the arteries is at no time augmented, and the increase in the systolic pressure, often observable soon after the administration of digitalis, is generally assumed to be due to contraction of the blood-vessels. But as the rate of the blood stream quickens under the influence of the drug the vessels give a greater volume of blood to the heart than they receive from it; the result is a fall of the arterial pressure and a rise in the intracardiac pressure. The angina-like pain from which patients suffer who are under the influence of an overdose of this drug and the fatal issue which sometimes, though rarely, attends its use, is to be attributed to high intracardiac pressure.

We see the action of digitalis does not effect, as is generally held, a diminution of blood on the venous side and a piling up of the fluid on the arterial side of the circulation. The true facts are different. The action of digitalis brings about a diminution of the quantity of blood in the peripheral circulation and a piling up of the fluid in the heart's cavities.

TABLE I.—*Digitalis.*

Av. = About average duration of a single beat in seconds.

Case.	Date.	BP S	BP D	BP P	Av.	Case.	Date.	BP S	BP D	BP P	Av.
1	22/12/20	140	98	42	0·56	5	1/10/20	105	85	20	0·54
	28/12/20	105	60	45	0·76		8/10/20	125	80	45	0·83
	4/1/21	115	70	45	0·56		15/10/20	100	85	15	—
2	17/12/20	140	100	40	0·56		22/10/20	105	76	29	0·62
	21/12/20	150	110	40	0·36	6	22/12/20	110	78	32	0·72
	28/12/20	118	78	40	0·64		28/12/20	125	76	49	0·72
3	22/10/20	130	100	30	0·66		4/1/21	118	75	43	—
	29/10/20	120	75	45	0·6		11/1/21	140	80	60	0·6
	3/11/20	145	105	40	—		21/1/21	88	35	33	0·76
	19/11/20	95	75	20	0·68	7	7/12/20	105	70	35	0·52
4	12/10/20	145	115	30	0·74		14/12/20	105	58	47	0·52
	26/10/20	130	86	44	—		21/12/20	100	45	55	0·59
	10/11/20	120	85	35	0·72		28/12/20	125	55	70	0·63
	26/11/20	120	78	42	0·7		4/1/21	100	55	45	—
							11/1/21	108	70	38	—
							18/1/21	100	60	40	—

Cases 1, 2, 3, 5, 6, digitalis xv., thrice daily. Case 4, C. Case 7, digitalis xv.

BP, blood pressure. S, systole. D, diastole. P, pulse pressure.

The figures in the first line of each case represent readings taken just before digitalis was administered.

It is a common occurrence to observe a sudden rise in the systolic pressure after the patient has been for some weeks under the influence of the drug. Possibly this rise is in the nature of a reaction to the condition of the circulation, brought about by digitalis and not to the direct action of the drug.

TABLE II.—*Atropine.*

Sec. = Duration of beat in seconds.

Case.	Before injection. BP S	BP D	BP P	Sec.	Atropine: Time P.M.	About ½ hour after injection. Time P.M.	BP S	BP D	BP P	Sec.	About 1 hour after injection. Time P.M.	BP S	BP D	BP P	Sec.
1	155	85	70	0·72	1/75, 2.20	2.40	105	70	35	0·88	3.30	145	80	65	0·84
2	115	60	55	0·85	1/75, 2.30	3.0	105	80	25	0·9	3.15	115	78	37	0·92
3	125	78	47	0·6	1/75, 2.10	2.40	74	48	26	0·6	5.15	90	65	25	0·64
4	115	78	37	0·72	1/75, 2.15	2.45	70	52	18	0·88	3.30	115	78	37	0·96
5	108	68	40	0·6	1/75	2.50	70	50	20	0·64	3.30	100	65	35	0·85
6*†	150	65	85	—	1/75, 2.45	3.15	110	45	65	—	3.15	170	65	105	—
7*	75	50	25	0·64	1/100, 2.15	2.45	75	60	15	1·2	3.45	80	58	22	0·76
8*	125	85	40	0·72	1/100, 2.20	3.0	110	89	21	0·68	4.0	110	80	30	—
9	120	96	22	—	1/75, 2.5	2.30	80	48	32	—	3.15	50	40	10	—
10*	120	76	44	1·0	1/50, 2.5	2.35	100	68	32	0·77	4.10	55	48	7	0·72
11*	100	68	32	0·6	1/50, 2.10	2.45	85	68	17	0·48	3.18	90	64	36	0·5
12*	80	50	30	0·93	1/50, 2.30	3.0	35	54	19	0·6	4.30	100	70	30	0·6
13	115	60	55	1·08	1/50, 3.0	3.30	120	75	44	0·84	—	—	—	—	—

* These cases have been under the influence of digitalis. † A case of auricular fibrillation. ‡ Some cases did not react to atropine.

Quickening of the Pulse-rate Resulting from Action of Digitalis.

Once it is recognised that owing to the action of digitalis the volume of blood in the heart's cavities is augmented, another feature in connexion with the action of digitalis becomes comprehensible, which otherwise would remain unexplained. It is a well-known fact, to which I have already referred in this paper, that the pulse frequency increases if digitalis is

[2] Gottlieb and Magnus: Archiv für Experimentelle Pathologie und Pharmakologie, xlvii. Edmund: American Journal of Physiology, xviii.

pushed long enough. Paralysis of the vagus is the orthodox explanation of this phenomenon. This explanation is unsatisfactory. I pointed out somewhere else that the dose of digitalis required to bring about an acceleration of the pulse-rate stands in a definite relation to the condition of the myocardium. If the latter is affected a small dose of digitalis is sufficient to bring about a quickening of the pulse-rate. It is difficult to understand why the vagus should so much more easily be paralysed when the heart muscle is diseased. As a matter of fact, as will be seen later on, there is ample evidence to show that the vagus function is not impaired at the time when acceleration of the pulse-rate takes place. To what, then, is the frequency of the heart's action due?

It is generally assumed that the endocardium is endowed with an apparatus, stimulation of which is the exciting cause of the systole. The volume of blood in the heart's cavities has a good deal to do with the bringing about of a systolic contraction. It is obvious that if the cavities of the heart are filling up at an accelerated rate a volume of blood sufficient to excite a systolic contraction will accumulate in a shorter period of time than is normally the case. In other words, the pulse will become accelerated. No doubt digitalis acts also on the inhibitory apparatus, but the longer the patient has been under the influence of the drug the higher the rate of acceleration of the flow of the blood through the vessels. Soon a condition will be reached which overbalances its inhibitory effect. We see it actually happening in Case 1, Table I. Digitalis first effected an increase in pulse pressure. When the patient was kept under this drug for another week no further increase in blood pressure was recordable, but a pronounced acceleration in the pulse frequency took place instead. A further increase in pulse pressure was evidently impossible in this case, simply because as soon as the intracardiac pressure reached a certain height it excited systolic contraction.

The slowing of the pulse-rate brought about by atropine is evidently due to vagus stimulation. Apparently 1/100–1/75 gr. of atropine is not strong enough a dose to effect paralysis of the vagus endings. We know vagus stimulation lowers the output of the heart; hence the smallness of the pulse pressure. The intracardiac pressure will be diminished under these conditions, owing to the feebler contraction. The latter circumstance would explain why the cardiographic signs which are attributable to a high intracardiac pressure disappear under this drug. We have seen that in cases which, under the influence of digitalis, have exhibited an accelerated pulse frequency an injection of atropine effects a lowering of pulse frequency. Evidently the vagus function remains unimpaired, in these circumstances, as otherwise this nerve would not react to stimulation.

Atropine in doses of 1/50 gr. evidently paralyses the vagus ending, the pulse-rate is increased, the duration of the diastole being shorter than normal, the heart would not completely fill itself as is normally the case; the output per single beat would accordingly decrease, and one would get a relatively small pulse pressure under the circumstances. Evidently the total output of the heart under atropine is less than normal, otherwise we would be unable to explain the fall in the systolic pressure.

Summary and Conclusion.

Under the influence of digitalis the diastolic pressure becomes lower and incidentally the systolic, whilst pulse pressure rises. The decline of the diastolic pressure is not due to a diminished output of the heart—the contrary is the case. The low diastolic pressure is neither due to dilatation of the arteries. The conclusion is that the blood stream leaves the arterial circulation at a greater rate than under normal conditions. The corollary to this conclusion is that under digitalis the heart contains at the beginning of the systole a greater amount of blood than before. The quickening of the pulse observed in the latter stages of digitalis is due to the fact that in a shorter time than normal the intracardiac pressure is sufficiently high to excite contraction.

THE X RAY APPEARANCES OF SO-CALLED OSTEO-ARTHRITIS OF THE SPINE.

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THE excuse for publishing this short article is that it deals with certain facts in connexion with this disease which are apparent on radiographic examination, and which, to my knowledge, are either unknown or have never been published before. Excluding the question of injuries, one of the commonest conditions to be found in the routine examination of hospital patients is that of so-called osteo-arthritis of the spine. In fact, excluding tuberculous disease, the well-known appearances presented in this condition are continually cropping up, and it is interesting to note how often the clinical symptoms associated with other diseases can be proved to be due entirely to this pathological state. The commonest and most interesting of all is that in which the patient is sent to the X ray department suspected of renal calculus with typical symptoms of pain in either loin, sometimes very acute, and even (if the history is to be believed) of hæmaturia, although how the latter can be caused is a mystery.

An analysis of 196 cases sent to the department in 1913 and suspected of renal calculus resulted as follows:—

Calculi present	19	or 9·7 per cent.
Calculi not present	144	,, 73·4 ,,
Cases not re-examined	12	,, 6·1 ,,
Osteo-arthritis of spine	17	,, 8·7 ,,
Nephroptosis	1	,, 0·5 ,,
Calcareous deposits	2	,, 1 ,,
Bone growth	1	,, 0·5 ,,

From this it can be seen that the number of cases which prove to be osteo-arthritis of the spine and not calculus very nearly equalled the number of cases of renal calculus, the other conditions present totalling together only four.

The cases which were not re-examined were either those in which the patient did not attend again or in which the physician himself decided that the doubtful shadows, combined with the weak clinical history, did not substantiate the original diagnosis, and therefore were probably neither osteo-arthritis nor calculus. An examination of a very large number of cases, both on living subjects and dried specimens, has led to the conclusion that the disease is unequal in its distribution. The dorsal region is by far the commonest to be affected; then come the lumbar and sacral regions; and, lastly, the cervical regions. This distribution is important from the X ray point of view, because the dorsal region, being hidden by the heart, diaphragm, and liver shadows, is the most difficult to see; and it is extremely probable that numerous cases of even well-marked osteo-arthritis in this region are bound to be missed on the most careful examination when the disease is solely confined to this area of the body, as is frequently the case. Another important point is that the disease has to be very fairly advanced before any departure from the normal can be detected. These two points alone—namely, greater susceptibility of the dorsal region and inability to diagnose very early stages of the disease—lead to the conclusion that the condition is much more common than has been generally supposed.

Two Distinct Types, very rarely Combined.

There are radiographically two distinct types of osteo-arthritis of spine, though very rarely one sees them combined.

Type A.—The first type is very uncommon, but undoubtedly occurs; in this type there is no typical "lipping" of the articular edges of the vertebræ, but only an erosion of the fibro-cartilage between adjacent vertebræ, causing approximation of the bony segments of the spine. In four cases this had undoubtedly taken place, and was not caused by any caries (tuberculous or otherwise), and in all four cases the condition was limited to two adjacent segments in the lumbar region with the intervening fibro-cartilage. In one of these cases there was present also, lower down in the lumbar region, the typical "lipping" generally associated with this disease, and forming the second type.

Type B.—This second type can be met with in all stages, from slight "spikiness" of the articular margins to complete synostosis of the whole of the spine—forming the well-known poker-back spine. The gradual progress of the disease of this type is as follows: It may commence either unilaterally or bilaterally, and may be equally marked on both sides, or one side may be more involved than the other. Whichever way it is, the affected side or sides first shows this slight sharpening of the normally round lateral borders of the bony articular surfaces. This increases in extent, and as it increases the spikes so formed tends to turn slightly outwards and downwards in the case of the lower articular margin, and upwards and outwards in the case of the upper articular margins. Both these spiky prolongations then turn directly upwards and downwards, so that they eventually meet and fuse. Then if the disease progresses this band of opacity gradually thickens, so that eventually a solid shadow is seen surrounding the affected segments and hiding all details of the spine itself. The whole appearance (if both sides are involved) is then that of a spine over which plaster-of-Paris had been poured and then allowed to set.

This state of affairs is so unlike that presented in any other osteo-arthritic conditions seen elsewhere in the body that it seemed possible some other factors were present in the spine which allowed the disease to progress much more markedly and in a different manner than elsewhere. Accordingly, with the kind permission and assistance of Professor S. G. Shattock, to whom I am greatly indebted, a number of dried osteo-arthritic spines were examined at the Royal College of Surgeons of England and photographed and X rayed.

From the examination of these specimens two important facts were deduced, one of which has already been mentioned—namely, that even when the disease is quite well advanced the X ray plates of the dried skeleton show very little change. How much more, therefore, would be the difference in the living body when the faint shadows seen in the dried bones in the early stages would not be differentiated at all. The second fact is even more important. It can be seen conclusively from the appearance of these so-called osteo-arthritic deposits along the lateral borders of the "poker-back" spine produced, that the normal rounded outlines of the vertebræ are unaltered, and that these deposits are not bony in origin at all, but are due to calcareous masses surrounding the normal vertebræ—i.e., calcification in the lateral and sometimes central portions of the anterior common ligament of the spine. The actual bone itself is unaltered, the differentiation between the two shadows being quite plain. Consequently this condition is not that of an osteo-arthritis at all; it should rightly be termed a state of fibrositis ossificans, in order to differentiate it from the true osteo-arthritic condition seen in true bony "lipping" of the knee-joint, where actual proliferation of the bone itself takes place.

This fact suggests a possible explanation of the difference seen in the two types, A and B, of this condition. It is well known that one of the first effects of this disease is to cause atrophy of muscles and loosening of ligaments around the seat of the disease. This fact is taken advantage of in certain forms of treatment for osteo-arthritis of the knee, when by means of tuning up the muscles around the joint (by electricity, &c.), the joint surfaces of the femur and tibia, which before were pressing on the semilunar cartilages, and thus causing pressure erosion and pain, are now forced away from each other with consequent relief of the symptoms, although the actual bony proliferation of the articular edges still remains.

This state of affairs must exist also in the affected spine so that, owing to the relaxation of ligaments, pressure erosion takes place of the fibro-cartilage between the bony segments, but at the same time, or before this, calcification begins in the common ligament. If this latter condition is delayed erosion of the disc occurs, possibly followed later by calcareous deposits. If, however, as usually happens, calcification advances considerably before pressure erosion takes place, then, although the ligaments have weakened considerably, yet by reason of their solidity owing to deposition of salts the two segments of the spine are kept apart as if by buttresses, and consequently no pressure occurs on the fibro-cartilage.

MANIFESTATIONS OF HYSTERIA.[1]

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IT has probably seemed to some that hysteria is more important and more common of late years than in the past. For reasons which we all appreciate the patients who present hysterical manifestations are now more numerically apparent, but there is no evidence which points to a material difference in their variety. We have recently been deluged with a literature of hysteria, and on this account I must ask your indulgence for taking the subject as the text of my lecture; but the condition is of such importance and diagnostic mistakes are still so numerous that an unfailing interest in it is amply justified.

Various theories have been put forward to explain the puzzling fact that hysterical manifestations are displayed by one person and not by another; in acknowledging here the help of writers and colleagues, I should like to bear personal testimony to the excellent work of Dr. A. F. Hurst, whose conviction that hysteria consists of symptoms produced by suggestion, and therefore curable by psychotherapy has proved to be correct in what is possibly a majority of cases. In capable hands the disability has been permanently cured; but in some persons who show the manifestations of hysteria the suggesting element which results in the particular disability is amazingly difficult to discover. In the case of patients who are not cured either this definition is wrong, diagnosis is incorrect, or treatment is inadequate. The mental condition of a hysterical patient is closely connected with his special symptoms, but is not necessarily identified with them. In some patients symptoms are readily and permanently cured, leaving the individual apparently normal; in others the symptoms are perhaps cured, but the mental state fails to react to the same degree, with the result that the patient is less happy after treatment than before. The reasons for this state of affairs are thought to be fairly well known. Considerable experience is needed in order to decide correctly how much explanation of the cause of the symptom shall be given to the patient, and what proportion of the explanation shall precede or follow the cure of the symptom, but it is probable that in some cases the physician's outlook is insufficiently wide. Comparatively few possess at the same time neurological convictions adequately strong and a personality sufficiently optimistic and courageous, internally as well as externally, to carry out with constant success the treatment of hysteria. The most experienced medical man may have to deal with a nervousness lest his capacity, proved in the past, may fail him. The onlookers anticipate a cure, and if a dramatic result is not immediately forthcoming they sometimes waver audibly in opinions which a moment before seemed fixed and immovable. Many patients can be labelled hysterical at a glance. Others need diagnostic acumen. Once a case is definitely diagnosed hysterical the patient is to be regarded equally definitely as curable.

The observer, whether practitioner or friend, who first witnesses in its infancy a manifestation of hysteria is responsible if it continues, for every case can probably be strangled at the onset; but a hysterical symptom is not necessarily more difficult to cure because it has reached maturity.

A Case Illustrating Onset of Hysterical Palsy.

During a visit to a nursing home I was asked by the matron to see one of the maids who had managed to get a crotchet needle beneath the skin of her palm. "Oh, it *is* sore," she said, as I entered the room, "and I can't move any of my fingers." The needle was doing no immediate harm, but its

[1] A lantern lecture delivered before the West Kent Medico-Chirurgical Society on March 11th, 1921.

influence was harmful, so I held its free end and ordered her to move her fingers in all directions, also her wrist, elbow, and shoulder, pain or no pain. Later the needle was removed, and she at once resumed full work. It is my custom to make a patient demonstrate the absence of hysterical sequelæ at once after every operation with a hypodermic needle, intrathecal needle, and the like. I have heard of a case of hysterical paraplegia following lumbar puncture, and I have seen severe palsy of the upper limb after vaccination, and also after a subcutaneous injection of antitoxin over the deltoid. We who sit here imagine, no doubt, that we are immune from the possibility of acquiring these manifestations, but I wonder whether we are right in so thinking. I believe that the wish is father to the thought.

Psychology of Hysteria.

I am not going to trouble you with long terms and strange words in an attempt to explain the psychology of hysteria; I believe that many are dissuaded from a study of this subject by the regrettable fact that, even in English, its language is foreign. Englishmen do not readily acquire a knowledge of strange tongues. I think it must be difficult to explain in any language the exact reasons why, for instance, one of my cases lost his hair. Seven years before I saw him he was in a fire-brigade, and during the two months which followed his burial beneath the ruins of a burning house he lost permanently every hair of his body, including those of the nares, pubes, eyebrows, and lashes. My difficulty is that I have seen no case resembling this in men who were buried during the war under nearly identical circumstances, so that we might suppose the physical and mental reaction would be similar.

I have said that we can directly prevent the consolidation of a hysterical disability without any but the most superficial examination, provided that we witness its onset and appreciate its cause. If, however, we meet the case after consolidation has occurred, at a period near to or remote from the onset, we shall examine with care, bearing in mind that a minute examination may serve to increase the patient's idea of physical illness. A sufficiently accurate examination can, as a rule, be made, under cover of conversation or the like, to exclude organic disease and, at the same time, to prevent undue interest in the mind of the patient. Above all, we must not adhere too closely to the reports of former advisers, for it is easy to have the diagnosis of hysteria suggested to our own minds to the mutual disadvantage of patient and physician. But hysteria is so very common that it should be in our thoughts in every case where there is no evidence of organic disease, or where the organic lesion has healed, or where the lesion is at best inadequate to account for the disability—given at the same time a temperature and pulse-rate which do not vary materially from the normal over a period of time. An isolated temperature of 98° F. taken in the consulting-room is apt to be misleading.

The disabilities of all of us are either physical or mental both in their origin or their continuation. The population contains more physically fit than the reverse, but it is a question whether this can be said of the entirely mentally fit. I think that many of us are mentally ill at fairly frequent intervals. No doubt it is easier to recognise this in others than in ourselves; but however this may be I feel that there is always a good chance that a patient may have no primary physical lesion.

A Mistaken Diagnosis.

The following misapplication of the practice of psychotherapy occurred in my own experience. For 18 months a young officer had limped and complained of pain in the right lower limb. For three months he had required a stick, and with this he walked about every day. He did not look ill, and no evidence of disease was detected by his physician or myself. He was able to stand and hop on the affected limb, but when he lay down he could not raise the leg against gravity. He could, however, support it in the air when it had been raised passively. He was encouraged to use the limb with considerable success, and after the examination walked back to his ward by way of an extensive garden. The same evening he collapsed suddenly and died. A sarcoma of his pelvis had reduced his acetabulum to the consistency of egg-shell, and the ischium was removed with scissors. There was extensive hæmorrhage in the thigh and retroperitoneally as high as the kidney.

In the past few months diabetes, malignant endocarditis, and cerebral tumour have been referred for treatment by psychotherapy, and I have a patient who for months wore an apparatus for foot-drop which followed the removal by frost-bite of two toes.

Varieties of Hysterical Manifestations.

There is little to be gained by a recital of the varieties of hysterical manifestations or of the precise causes of their occurrence. In the treatment of hysteria the physician deals with every department of medicine. The clinical types can be grouped broadly as follows: headache; sensory disorders of skin and mucous membranes (so-called subjective and objective), whether decrease, abolition, increase or pain; disorders of muscular contraction or control, spasms either tonic or clonic, or palsy, all of which can be voluntarily imitated, which may be manifest in abnormal gait or posture; abnormalities of speech and articulation, aphonia, stammering, and the various laryngeal and respiratory tics, including cough and hiccough; disorders of the special senses; disorders of cerebral control, such as fits, sleep-walking, insomnia, or excessive sleep; gastric and intestinal disorder, with needless vomiting, constipation, diarrhœa, flatulence, and incontinence and retention of urine. We must also remember that hysteria is seen in quite young children.

Hysterical pain is of abiding interest to us all. If a patient says he has pain we must assume that he has. It is useless to tell him that he merely imagines he has pain. Our work is to discover whether the behaviour of his pulse, temperature, sweat glands, and pupils resembles that which our experience has shown to be characteristic of proved organic mischief; and if it is not we try by persuasion to get the patient himself to modify his former opinion and statement. Pain, after all, is the reaction to a stimulus, and the reaction is variable. The duty of the physician is to weigh all the evidence and then to assess the probable value of the patient's statement.

In October, 1915, a lad sustained a comminuted fracture of the proximal phalanx of his great toe. A piece of metal had dropped across his foot. In December, 1915, the toe was amputated at the site of fracture and special pain was complained of directly consciousness was regained. This persisted. In August, 1917, I found the foot held in a varus position owing to localised pain. He was unable to do much apart from drawing his compensation payment. The toe-nails on the right foot had not once required cutting since the accident. No other evidence of disease was found, but the patient's attitude towards examination was not normal. He would not tolerate the slightest touch on the affected part unless his attention was previously distracted, and said he wanted to have his foot off; nevertheless, he got about the ward with comparative ease and slept well, the limb requiring no protection from the bed clothes. I made a note that the failure of the nails to grow was evidence of injury to the peripheral nerves, and then proceeded to cure the pain. Conversational methods were useless, so I took off my coat, grasped the toe stump, and held on. Over and over we went round and round the room, the roars of the boy arousing the hospital, but in 15 minutes he had ceased his struggles and I had won. He at once put on his ordinary boots, and in a week was back at work in the dockyard. Six months later he was still full of gratitude.

Œdema or lowered local temperature, want of expression of the part, ridges on the nails, and the like are frequently seen in hysterical conditions. They may be due to the original organic lesion of which a residue has been perpetuated by hysteria, or they may be, in the case of contracture and spasm, caused by the deformity. Thus a hysterical disability may cause an organic lesion as well as the reverse. The organic signs must not, however, be allowed to dominate the picture. A man with agony of the lower limb persisting for months

after a sciatic neuro-fibroma, due to shrapnel, had been removed, and who begged for amptutation, was completely cured by psychotherapy. Had the abolition of the ankle-jerk on that side, due to the initial shock to the nerve trunk, been too lovingly regarded he would still be disabled from work. Hysterical wrist- and foot-drop is often diagnosed when the condition is in reality a monoplegia, flexors as well as extensors being useless.

Among gastric cases is that of a young medical man whose epigastric hunger pain persisted in the face of a laparotomy which disclosed no disease. At his second visit to me he gave me his belt and emptied his pockets of lozenges and biscuits. A great deal of constipation is, I feel sure, due to the unnecessary prescription of bedpans; unless the risks are very great patients should be let up. In every case of persistent vomiting or regurgitation of gastric contents, witness the act. A man of 23 had for two and a half years brought up a mouthful of fluid half an hour after each meal. He then swallowed it again. Gastric lavage and bismuth meals were naturally ineffective. He mentioned tea in particular, and at his first visit, after conversation, I gave him tea. Nothing abnormal occurred and he was amazed, saying that he was better than for 12 months. "My improvement is wonderful and I cannot understand my previous treatment." A man who complained that he always belched whenever he put a pipe between his teeth was cured by opening the mouth on a gag for a time and by teaching him the needlessness of the act rather than by dieting, alkalies, and carminatives.

An instance of the overflow of needless energy, destructive and painful, yet giving a moment's pleasure withal, can be observed in a man now in my ward. He has a craze for biting through his lower lip with his incisors and for a year or more has not withdrawn his protecting finger from his mouth, either for meals or for rest or during sleep. He has shown his wisdom, however, in resisting advice to have the teeth extracted. I think it probable that many tics are merely forms of hysteria.

Hysterical affections of the bladder are fairly common and are especially tragic when unrecognised. During a night retreat in France in November, 1914, a man fell into a trench. Before, during, and after his fall he was frightened, and that night he allowed a little urine to escape in his sleep. Later on he heard someone say something about a fractured pelvis and injury to bladder, and for the next three and a half years, though well in other respects, he had passed urine every hour. His clothes were soaked and so was his mattress until he was presented with a urinal for use at night. He used it for 12 months. Treatment consisted of an explanatory statement that an injured bladder would not so behave. This was news indeed to him. Then followed a demonstration in the lavatory of perfect sphincter control.

Hysterical disorders of the special senses and hysterical fits are of vast interest. The cry which may precede the epileptic attack is not to be mistaken, but the doctor rarely witnesses the initial stage of the fit.

Malingering and Hysterical Deception.

Malingering must not be diagnosed unless the patient is found in flagrante delicto or his voluntary confession elicited, and neither of these occurrences is entirely free from the possibility of error. A man with vision of less than 6/60 was allowed to hear read out at a class the remarks of a fictitious professor that in cases of blindness which followed cerebro-spinal fever the patient could invariably see and recognise a small object when it was one among others. Having persisted in failure to see a penny on a piece of white paper, and the class having been reminded in his hearing that the man's original illness was cerebro-spinal fever, his eyes were uncovered, and he promptly recognised the details of the penny placed between two other coins. Yet I doubt if he lied consciously in the first instance.

The motives which underlie the deception of the hysteric are not always apparent. The correctness of the diagnosis is proved by the cure alone, but it does not follow that failure to cure is an indication that the diagnosis should be changed to that of malingering The following is an instance of confessed malingering. A man of 20 in 1917 came in a bath chair to see me. His right leg had been comparatively useless for nearly a year. The trouble had followed a fall from a ladder, and for many weeks he had been lying at home instead of assisting his country. He arrived at the hospital in a motor ambulance. I was prepared to consider him hysterical, even when he jumped up with alacrity on seeing me prepare the battery; he admitted, however, that he was ashamed of himself, and was told to propel the steward back to the ward in the bath chair. The following day he refused further examination, although he still limped a little, saying that his certificates about paralysis were as good as mine. The sentence of the court-martial was six months' hard labour. Possibly this served his purpose.

Preventive Treatment.

There can be little doubt that if, prior to or at the immediate onset of hysterical disabilities, a personality, professional or otherwise, was at hand the vast majority of them would be killed at the onset. The instance of the girl with the needle in the hand is a case in point. The ideal is to prevent before onset by reassurance. Nothing is so remarkable as the way in which the statements of medical men to their patients settle in their minds. For years they recall and repeat them, and when they are erroneous they may defeat the object of subsequent treatment.

Treatment of Consolidated Cases.

The essentials for this are a capacity for confident recognition of the nature of the disability, sympathy, unlimited patience, plenty of time, opportunities of seeing the patient from time to time after treatment has removed the disability, and a refusal to be put off the scent by failure. Treatment is thoroughly hard work. When in the case of a palsy I have made a decision, I photograph the patient and I tell him at the same time to arrange for the photographer to come, in say two days, to make a record of the cure. In these cases sticks and crutches are broken before treatment is started. I detain a cured case for his influence on the next, and I require a voluntary signature that the cure is complete.

(1) Methods of conversation and explanation are, no doubt, the ideal forms of treatment, but failure is fairly frequent. The intelligent coöperation of the patient is sometimes wanting. In my experience the use of faradism is of little avail except to demonstrate to the patient the integrity of the muscles or to increase by suggestion the area of normal sensation, so that by degrees it includes the area which is anæsthetic. Cases of vomiting, incontinence, fits, and so on, are specially amenable to conversational methods.

(2) I have frequently had recourse to treatment by suggestion and gross-suggestion, and with considerable success, but I am not necessarily proud of the method. Should ethical reasons dissuade us from finding with the X rays an imaginary lump pressing on the nerve in a monoplegic limb and from removing it by "deep and painful massage" under anæsthesia? Does the proved success in former cases justify us in performing an operation for a lesion which is imaginary in a case of hysterical deafness? I was criticised strongly after I performed a trephining operation[2] in a case of hysterical sleeping attacks, but my critics did not say what I should have done to the patient, who was in the habit of going to sleep during conversation. I think that those who formerly relied on hypnotism are making less and less use of it. Hysteria and a capacity to be hypnotised are not synonymous terms. Neither are suggestibility and hysteria synonymous. We are all of us suggestible, but it seems that the hysterical have a peculiar susceptibility to suggestion.

When the symptoms are cured is there anything else to cure? Sometimes there is and sometimes not. As a rule, when there is something else left it will be relieved by the accompanying conversational methods, but much depends on the presence or absence of matters

[2] This case was described in THE LANCET, 1919, ii., 1128.

connected with pension and unemployment. Cures have been stabilised by the mention of punishment in the event of relapse after demonstrated relief from disability.

(3) Psycho-analysis is necessary to throw light on unconscious motives in other cases. To bring into the front line of consciousness repressed experiences we may make use of the most careful case-taking and inquiry with success. I confess myself to a wonder whether the ablest analyst would elicit anything of importance which I could not tell him at the outset, but until I have had some hysterical condition which has resisted cure by other methods perhaps I ought to keep silence about this. As regards conscious sexual motives and movements, homosexual and otherwise, I have been struck with the facility with which these are brought out in conversation. Drug habits may be cured when the underlying unhappiness or loneliness is made manifest and removed. The variety of the drug matters little. It is needed no longer by the patient, who is completely mentally happy. The importance of putting cause and effect in the correct sequence to masturbators is very considerable; in fact, for all disabilities, hysterical or otherwise, there is more in treatment by psychotherapy than we sometimes dream of.

TWO CASES OF
RETROPERITONEAL HÆMORRHAGE.

BY T. G. D. BONAR, M.B., B.S. LOND., M.R.C.S.,
SURGICAL ASSISTANT AND DEMONSTRATOR OF ANATOMY, GUY'S HOSPITAL.

THE two following cases may be of interest, first, because of their similarity of history and symptoms, and, secondly, on account of their difference in result and pathology.

CASE 1.—M. A., a woman aged 30, was admitted in October, 1919, complaining of abdominal pain, vomiting, and constipation of some days' standing. She was married and had had four children, all of whom were alive and well; no physical defect in them had been noticed. Her mother and father had both died from pulmonary tuberculosis, whilst she herself had suffered from anæmia and had signs of a left apicular phthisis. She gave a history of her left eye having been removed for "tuberculous trouble" some years previously, although the actual lesion we were unable to ascertain.

Her history of the present disease was as follows: Her last baby was born in December, 1918, and the day before the birth of the child she slipped and fell heavily on the pavement, but she felt no ill-effects after it. In May, 1919, she noticed dragging pains in her right loin, followed by a swelling, which moved readily when she turned from her side to her back, the swelling always falling into the most dependent position. She paid no attention to the swelling and pain, but continued with her work. Her bowels were always regular and her appetite was good. The day before her admission in October, 1919, she was suddenly seized with a violent attack of pain in her right hypochondrium, and she began to vomit incessantly a greenish-coloured fluid. She had than been constipated for the last four days.

On admission on Oct. 5th, 1919, her pulse was 98, temperature 99·2° F., and respirations 24. She looked extremely ill, had a drawn face, and was bathed in cold sweat. Her tongue was dirty, furred, and had commencing sordes. She had great pain in her right side and felt as if she wanted to vomit, although she was unable to do so. The pain travelled round from her right hypochondrium to the back of her right loin. On examination she had phthisis at her left apex and her breathing was shallow. Her abdominal wall moved well on respiration, but she was slightly rigid and tender over a small area just below her ninth and tenth ribs in her right hypochondrium. A vague swelling could be felt bimanually in the right hypochondrium and there was tenderness and swelling in her right loin. Her urine was normal; rectal and vaginal examinations revealed nothing. A turpentine enema was given, but was returned without result. After being in bed for a couple of hours she felt much easier, but five hours after admission the pain returned and was worse than before. She was now definitely tender and rigid over the whole of the upper part of her right rectus muscle. The vague tumour was still palpable, but could not be traced upwards or downwards. She was not tender under her costal arch nor for a distance of 1½ in. below it. Her pulse and temperature had both fallen, so she was given a hypodermic injection of morphine gr. 1 6th. An hour later she was much easier, and she spent a fairly comfortable night.

The next morning she again vomited large quantities of the greenish-coloured fluid. On abdominal examination she was very rigid and tender in her right hypochondrium. The previously small tender area had now increased in size, having extended as far laterally as her left rectus muscle and downwards into her right iliac fossa. By mid-day she had vomited four times, and she now was becoming distended, and peristalsis was visible on the left side of the abdomen above the level of the umbilicus.

It was decided to perform laparotomy, the diagnosis being held over. An acute cholecystitis or an appendicular abscess was suggested but the difficulty was to explain the visible peristalsis. The abdomen was opened by a right paramedian incision. On opening the peritoneal cavity the distended transverse colon forced its way out. On examining the abdominal contents the whole large gut was found to be distended, but the small intestine was not, nor was there any cause of obstruction found. The left kidney, gall-bladder, stomach, pancreas, appendix, and pelvic organs were normal. The right kidney could not be palpated definitely owing to a large retroperitoneal hæmorrhage of recent origin. The maximum amount of clot was behind the hepatic flexure of the colon, and the clot extended downwards as far as the mesentery of the appendix and to the mid-line as far as the aorta. There was no obvious cause for the hæmatoma. There was no free blood in the peritoneal cavity. The intestines were returned and the abdominal cavity sewn up.

After the operation great difficulty was experienced in getting the patient's bowels to act in spite of the frequent doses of ol. ricini, calomel, other purges, and pituitrin. After they had once begun to act no difficulty was experienced. She did very well after the operation, and at a later date she was X rayed, but no evidence of either thoracic or abdominal aneurysm was detected. She was discharged the end of October, 1919, feeling much better and looking very well.

In November, 1920—a year after her operation—she was admitted to a hospital outside London, complaining of vague pain in the right loin. On examination a large palpable right kidney was discovered. Her urine was normal and there was no history of hæmaturia, or vomiting, or polyuria. X ray examination was negative. Mr. P. Turner, surgeon to the hospital, saw her and decided that operation was necessary. She was operated on in December, 1920, and an abdominal incision was made. A tremendous amount of bleeding took place at the operation owing to the shortness of the pedicle and the slipping of a ligature. On cutting through the perirenal fat great difficulty was experienced in separating the kidney from its attachment. After freeing the kidney it was found to be swollen in its lower pole, and the outside of the kidney was coloured a deep bluish-black colour. The kidney was excised. On examining the kidney after its removal its lower pole was found to be uniformly distended and stained a black colour. On sectioning the lower pole a gelatinous black non-encapsulated mass was found to be replacing the kidney substance. A section for microscopical examination showed melanotic sarcoma. Unfortunately the woman died shortly after the operation, so that no post-mortem examination was possible to ascertain whether there were other deposits of melanotic sarcoma.

I am greatly indebted to Mr. Turner for his notes on the above case and his permission to publish it.

CASE 2.—C. B., a woman aged 44 years, was admitted to Guy's Hospital on Jan. 18th, 1903, under Dr. (now Sir) William Hale-White,[1] for pain in the back, right side, and right iliac region. Patient had been married for 20 years to a tuberculous husband and had had seven children, all of whom had died young, the cause of death in six being chest trouble and in the remaining one diphtheria. Just two years before admission patient had had an attack of severe pain in the sacral region extending to the right side. This passed off in a few days, but since then she has had numerous similar attacks at intervals varying from a week to two months. In November, 1902, patient "brought up" blood clots and fainted, but felt better afterwards.

The history of the present illness is as follows: On Jan. 10th patient had an attack of pain in her right side of such severity that she had to take to her bed. The pain subsequently extended to the sacrum and right iliac regions. Since the onset of pain there had been absolute constipation, neither flatus nor fæces being passed. Her bowels had always acted regularly until the first attack of pain, but these attacks were always associated with constipation. There had been one attack of vomiting a day or two before she was admitted.

[1] Med. Reps., 1903, Hale-White, No. 35.

On admission patient was thin and cachectic. The abdomen was thin-walled and distended. Surface was irregular owing to protrusions of numerous coils of distended intestine. The abdomen moved well on respiration. There was visible peristalsis. On palpation the right iliac region was tender, and there was a marked resistance of the muscles on the right side of the abdomen. Occasionally it appeared possible to feel a firm mass in the right iliac region, but a minute or two later this would be impalpable. The abdomen was tympanitic on percussion. Patient also complained of a gnawing pain in the back, which was increased by movement. Various enemata and ol. ricini were given without result. Dr. Bryant and Mr. A. L. Dunn saw patient, and concluded that the diagnosis rested between appendicitis, chronic intussusception, and malignant disease of the cæcum and ascending colon. As the general condition was good it was decided that there should be a further period of observation before operation. For two days the condition remained unchanged in spite of further enemata and purgatives.

An operation was performed by Mr. Dunn on Jan. 18th, the abdomen being opened in the right semilunar line. The whole of the intestine, large and small, was examined, but no obstruction found. It was noticed that the lymphatics of the omentum was very distended with chyle. On the day following small doses of calomel were given hourly, followed by an enema, with a result that the bowels acted several times and the patient felt better. The improvement was maintained for several days, but on the 23rd, in the evening, the patient suddenly collapsed and, in spite of restoratives, died early in the morning of the 24th. At the post-mortem examination a ruptured abdominal aortic aneurysm was found. The sac, which was as large as an orange, was situated immediately below the diaphragm. The aneurysm had ruptured at its lower right-hand corner, the aperture being the size of a florin. There was extensive erosion of the last dorsal and the first two lumbar vertebræ. There was a very large amount of retroperitoneal hæmorrhage, blood being extravasated beneath the peritoneum over the whole of the right side and down into the right side of the pelvis.

Remarks.

The points of interest of the first case were:—1. Was the patient's eye removed for tuberculous trouble or was it a growth of the eye—e.g., melanotic sarcoma? I was unable to obtain any report on this subject, and had only the patient's statement for this. 2. Was the retroperitoneal hæmorrhage due to hæmorrhage in to an early growth in the right kidney with an extravasation into the retroperitoneal tissues? The right kidney at this operation was not reasonably palpable owing to the hæmorrhage. 3. At the second operation, a year after the first, the retroperitoneal hæmorrhage had been absorbed but had left adhesions around the right kidney, making the latter difficult to remove. 4. Was the melanotic sarcoma of the kidney secondary to the eye in spite of the strong tuberculous history obtained?

In the second case it is interesting to notice the following points:—1. The strong family history of tubercle. (Cf. the first case mentioned.) 2. The difficulty, as in the first case, in getting the patient's bowels to act; but, once opened, no further difficulty was experienced. 3. At operation, as in the first case, no cause was found to account for the visible peristalsis. 4. Both cases gave practically the same symptoms and signs clinically, and after death each had a different pathology.

THE LATE DR. THOMAS WATT.—**After practising** for 35 years at Paisley, where he was held in great esteem, Dr. Watt died on May 10th, aged 59. Originally intended for the teaching profession he graduated M.A. at Glasgow University in 1882, but afterwards took up the study of medicine, and in 1886 obtained the degrees of M.B., C.M., immediately entering upon general practice. In 1899, when there was a severe epidemic of enteric fever at Paisley, Dr. Watt took charge of the Infectious Diseases Hospital. Later he visited Germany, Denmark, and Holland in order to study milk-supply in connexion with tuberculosis, and on his return to Scotland was associated in a campaign to educate the public on the relation of milk in the prevention of consumption. At the time of his death he was senior visiting physician to Paisley Infirmary. He was also medical representative on the board of directors of the Royal Victoria Infirmary and medical officer to the post-office there. During the war he was actively associated with the work of the Red Cross.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF TROPICAL DISEASES AND PARASITOLOGY.

AT a meeting of this section of the Royal Society of Medicine on May 2nd, presided over by Surgeon Vice-Admiral Sir ROBERT HILL, a paper was read by Sir LEONARD ROGERS entitled—

The Mortality and Prognosis of Cholera Treated by the Author's Hypertonic Saline Method, based on 2000 Cases.

The hypertonic solution used was composed of 120 gr. of sodium chloride, 6 gr. of potassium chloride, and 4 gr. of calcium chloride to the pint of sterile water. It was administered intravenously, under strictest antiseptic precautions, at a temperature usually of 98–99 F. in amounts of one to two quarts according to the severity of the case, a period of at least 15 minutes being taken for the injection of one quart of fluid. That method of treatment introduced in 1908 to 1909 had proved a considerable advance on the use of rectal, subcutaneous, and intravenous injections of the normal isotonic salines formerly employed, and particularly so in association with the more recent administration of alkali and permanganate. A series of tables and diagrams providing a graphic record of the results of treatment by that means in the cholera wards of the Medical College Hospital at Calcutta, and of the various observations on patients suffering from the disease, together with the case-rate and mortality figures, were thrown on the screen and explained during the course of the lecture. An account was given of observations on the blood changes in cholera, including the blood pressure, specific gravity, the percentage of blood corpuscles obtained by the hæmocrite, and of the beneficial effect on the blood by means of hypertonic saline injections, which had materially improved the prognosis of cases. Indications for its use were failing pulse, blood pressure below 70 mm., and specific gravity over 1060.

Examples of the degrees of blood concentration and loss of fluid.—Taking the averages in seven fatal cases it was shown that the normal percentage ratio of the volume of blood corpuscles to serum being about 45 to 55, the percentage of corpuscles was increased to 71 and the percentage of serum reduced to 29, with a loss of fluid from the blood amounting to 64 per cent. In 12 cases recovering after transfusion the average percentage ratio of corpuscles to serum was 63 to 37 and the loss of fluid from the blood 52 per cent.; in five mild cases not transfused the average volume of corpuscles was 56 to 44 per cent. of serum and the loss of fluid 35 per cent.

Seasonal incidence.—Both before and after the introduction of the new treatment in 1908 the case-rates and death-rates tabulated month by month showed the highest mortality in the beginning of the year, and the tendency of the death-rate to fall steadily through the hot weather, attaining a minimum in the rainy season coincident with the greatest number of cases. The seasonal incidence was therefore of considerable importance, the case-rate being highest and the death-rate lowest during the rainy season.

Race and sex-incidence.—Statistics derived from the Calcutta Medical College Hospital, 1895 to 1905, had revealed no special susceptibility attaching to any one race. The Chinese, however, had proved much more resistant to the disease than Hindus. Males were attacked in greater numbers than females, probably owing to their more frequent exposure to infection. Although so pronounced a fall in the death-rate had been achieved by the new treatment, the relation of race and sex-incidence to mortality still showed no marked variation of either factor. (Table I.)

Among females exception occurred in the case of pregnancy, which considerably lessened the prospect of recovery from an attack of cholera, and therefore justified resort to premature delivery. The effect of the new treatment on the death-rate at various ages was remarkable. Under the old method of treatment in 1895 to 1905 the mortality among patients under 10 was 52·8 per cent., increasing as age advanced, to reach 73·7 per cent. among those over 50 years. With the use of hypertonic salines the reduction which had

TABLE I.

Race.	Percentage mortality.		Sex.	Percentage mortality.	
	1895–1905.	Under new treatment.		1895–1905.	Under new treatment.
Hindus	61·6	21·6	Males... ...	60·3	20·7
Mahomedans ..	57·3	20·4			
Europeans ...	56·5	18·8	Females ...	60·3	19·9

occurred in the death-rate of cases between the ages of 5 and 50 years was a very important feature, and for patients under the age of 10 it had fallen to 16·4 per cent. The influence of the duration of the disease previous to admission and treatment on the number of fatalities and cause of death was demonstrated by the striking fact that, if the attack had lasted 12 hours, collapse was the cause of death in 67·4 per cent. of fatal cases; and if admission had been delayed for 24 hours from the onset, death from uræmia occurred in 54·8 per cent.

The relationship of the specific gravity of the blood to the case mortality showed that the closer the blood approximated to the normal the lower was the death-rate—e.g., with a specific gravity of 1055 12·7 per cent. of cases proved fatal, but with a rise in specific gravity, 1067 to 1071, the death-rate was nearly doubled. It became evident that with specific gravity above normal more frequent saline transfusion was necessary, increasing in quantity from 1 litre if the specific gravity was 1062, to 2 litres if specific gravity rose to 1066. Study of the relation of blood pressure to cholera death-rate showed that with falling blood pressure the mortality increased, but the tendency to fall was counteracted by the treatment. In cases with blood pressure of 90 mm. or over the death-rate was 15·2 per cent., but rose to as high as 84·7 per cent. when the blood pressure fell below 70 mm. (Instances from Table I.). The effect of fall in blood pressure on the condition of collapse was also described, and examples showed that with a blood pressure of 90 mm. or over collapse occurred in 9·3 per cent. of cases, and in as many as 93·7 per cent. when the blood pressure fell to 70 mm. or under. It had been found essential to apply the treatment as soon as the blood pressure fell.

Low alkalinity of the blood in cholera.—Dr. Sellards, working in the Philippines, found that large doses of alkali could be given in cholera without increasing the alkalinity of the blood, and he had used injections of 2 per cent. sodium bicarbonate with success in overcoming anuria and relieving collapse. Colonel J. W. D. Megaw, who had seen Sellards' work, in 1911 gave injections of alkali with good effect in cases of choleraic uræmia. His own observations showed that reduction in the blood alkalinity of cholera patients was attended by an increase in the death-rate—e.g., with an alkalinity of N/45 the mortality was 12·5 per cent., if reduced to N/80–N/100 the death-rate rose to 27·3, and a still further fall in alkalinity below N/100 produced a mortality of 60 per cent. It was therefore apparent that a close relationship existed between falling blood pressure, a high specific gravity, low alkalinity of the blood and a high death-rate in cholera, and it was important that routine administration of alkalis should be carried out from the onset of the attack to avert fatal uræmia. The tabulated results showed that without alkali treatment the death-rate was 25·6 per cent., and in 11·1 per cent. the direct cause of death was uræmia, but under alkali treatment the mortality fell to 19·7 and uræmia provided only 3·95 per cent. of the deaths. Full details of four cases were quoted, showing the beneficial action of alkalis in increasing the flow of urine, raising the blood pressure, and reducing the high specific gravity of the blood, with the result that three out of the four cases recovered. Further particulars were given illustrating the relation of blood pressure and specific gravity of blood to the amount of urine secreted, and emphasis was again laid on the necessity for saline and alkali treatment in order to maintain the flow of urine. For the fall in urinary output coinciding with a low blood pressure of 75 to 80 mm. and a high specific gravity of the blood accentuated the dangerous association of blood concentration and arrested renal function, the combined result of the great drain on the tissue fluids caused by the frequent and excessive evacuation of the bowels.

The influence of the temperature on the death-rate in cholera was shown by records of rectal temperature and the corresponding case-mortality (Table II.).

TABLE II.

Temp. over.	Deaths per cent.	Temp. over.	Deaths per cent.
103° F.	5·2	95° to 96°	33·6
101°	9·1	95° and under	50·0

Owing to failing circulation and consequent increased heat loss from the body surface, it occasionally happened that axillary temperature readings were lower than the rectal.

Considerable interest attached to Table III., showing the relationship of the mortality rate to the number of hypertonic saline injections during the years 1912 to 1919.

TABLE III.

Year.	Death-rate per cent. of cholera cases.	Number of saline injections.				
			0–1	2–3	3–10	
1913 ...	24·5	Given in—	30·0	42·0	28·0	Per cent. of cases.
1915 ...	17·2		15·8	26·3	57·8	
1917 ...	14·6		20·0	16·7	63·3	
1919 ...	22·6		47·2	24·6	28·2	

Previous to 1918 the number of cases treated in hospital by the hypertonic saline method was about 200 in each year, but in 1918 this figure rose to over 300, and in 1919 to over 400. The table showed that for any given year the higher the percentage of cases receiving the larger number of injections the lower was the death-rate, particularly was this evident in the years 1915 and 1917. During 1918 and 1919 the number of cases requiring the treatment was so great that it was impossible in a large proportion of cases to administer more than one or two injections, consequently the case-mortality rose for those years.

The method of treatment by salines which had been employed during the last 25 years could be divided into periods as shown in Table IV.

TABLE IV.

Year.	Treatment.	Results in percentages.	
		Deaths.	Recoveries.
1895–1905.	Rectal and subcutaneous salines.	59·0	41·0
1906.	Normal salines intravenously.	52·0	48·0
1907.	Rectal and subcutaneous salines.	59·5	40·5
1908–1909.	Hypertonic intravenous salines.	32·6	67·4
1909–1914.	Hypertonics plus permanganates.	25·9	74·1

In subsequent years, by the addition of alkalis to the improved treatment already developed by the use of hypertonic saline and permanganates, there had resulted a still further reduction in the death-rate to 19·1 per cent. for 1915–1917.

Discussion.

Surgeon Rear-Admiral P. W. BASSETT-SMITH said that Sir Leonard Rogers's work on cholera supplied the best example he knew of the value of the application of scientific methods of deduction to the securing of successful treatment. The large number of statistics given had rendered possible the drawing of conclusions from the results, for it was important to have figures over a range of years. He himself had had no personal experience of the use of hypertonic salines, but he recalled in his early days in China the success attending the use of isotonic saline injections by Dr. Jameson in Shanghai, which established that means as the correct line of treatment in cholera, in order to replace the loss of tissue fluids, to encourage the secretion of urine, and to counteract uræmia.

Dr. P. H. MANSON-BAHR stated that opportunities of treating cholera in Egypt during the war had been few owing to the small number of cases which had occurred. He regarded the pathology of collapse as likely to be much the same in bacillary dysentery as in cholera, and to call for the same treatment. Although Sir Leonard Rogers's apparatus and outfit for dealing with cholera had been available, official sanction for its application in cases of dysentery was refused because the patients were not suffering from cholera!

Dr. W. BROUGHTON-ALCOCK had had opportunity of applying the hypertonic saline treatment with benefit in cases of bacillary dysentery, following the line of observation of the specific gravity of the blood. He had found the method of considerable help in cases of extreme collapse due to Shiga dysentery. He asked Sir Leonard Rogers how it was possible to diagnose mild cases of cholera quickly, for rice-water stools did not occur as often as he would have expected in mild cholera.

Sir LEONARD ROGERS, in his reply, referred to the successful use of isotonic or normal salines in China, and the fact that the Chinese were more resistant and responded better to the injections than did the Hindus. Failures in the past attending the use of salines by Dr. A. J. Wall in India had been due to the fact that he had employed not isotonic but hypotonic salines of 0·6 per cent. chlorides or 0·2 per cent. chlorides and 0·4 per cent. bicarbonate, instead of the 0·9 or 0·85 per cent. chloride of the normal isotonic saline. Bacillary dysentery responded well to hypertonic saline injections, together with rectal wash of permanganate. Saline treatment, especially if the solution was above normal, was of great value also in blackwater fever. For the diagnosis of mild cases he said that Colonel Greig relied on cultures grown on Dieudonné's media and then testing for agglutination with various strains of anticholera serum. Cholera tended to appear in cycles, one year of high being followed by another of low prevalence. The larger the number of cases the lower was the mortality, and the milder cases occurred towards the end of an epidemic.

The Ankylostomiasis Campaign in Egypt, 1913–1915.

A paper on this subject by Dr. A. F. MACCALLAN was read, in the absence of the author, by Dr. W. T. PROUT, honorary secretary of the section. As the result of reports on the prevalence of ankylostomiasis in middle Egypt by Sir David Semple and Dr. Graham, Lord Kitchener in 1913 instructed Dr. MacCallan to organise a campaign to investigate and deal with the disease, which was widespread in country districts and native villages. The sum of £E.12,000 was available for the campaign and this was directed to the erection of tent hospitals of 50 beds in the various villages, and travelling dispensaries to reach the more remote parts. Efforts were also made to improve the sanitary conditions, or rather to introduce sanitation in places where it did not exist, for the proper disposal of excreta, and to erect brick latrines. Under his direction a survey of the provinces of Shargui and Assiut was made by the late Dr. Stimner and Dr. Kennedy. The two provinces were divided into several areas, each of which was visited in turn by the travelling hospitals and mobile laboratories. Under the supervision of the two medical officers systematic examinations of the blood and stools of large numbers of the male natives were carried out by trained assistants. The stools in each case were submitted to washing and centrifugation, and at least ten minutes was devoted to the microscopical examination of the deposit for the parasitic ova before a negative report was returned. As the result of these investigations it was estimated that in Shargui province, with a population of 620,000, the incidence of ankylostomiasis infection among males amounted to 56 per cent., and in Assiut province, with a population of some 450,000, the incidence was about 46 per cent. It was only possible to examine about 1 per cent. of the population, and owing to the difficulty of obtaining specimens from female natives the examinations were perforce restricted to males. Through the agency of the travelling hospitals and dispensaries treatment by thymol was carried out with considerable success, the results amounting to over 70 per cent. of cures among patients treated. Valuable information was also obtained in the course of the surveys as to pellagra and bilharzia. Owing to the interference of the war the special campaign against ankylostome infection was necessarily suspended in 1915 and much then remained to be done to cope with the problem in the affected areas.

Based on what had already been accomplished, the need for the following preventive measures was advocated by Dr. MacCallan: (1) Recognition and obliteration of the habitat of the ankylostome larvæ; (2) introduction of proper sanitary measures in the villages and provision of a suitable pail system for the disposal of excreta; (3) erection of shelters in the villages for the treatment of infected natives; (4) treatment on scientific lines of cases of anæmia in the country districts; (5) research investigations as to the nature and action of the toxins of *Ankylostoma duodenale*.

Discussion.

Sir ROBERT HILL much regretted that Dr. MacCallan had been prevented from attending the meeting to deliver his paper.

Dr. J. B. CHRISTOPHERSON stated that the problem of ankylostomiasis in Egypt opened up a large field for investigation and treatment. From his own experience there he emphasised the need for peripatetic hospitals among the villages to deal with the three principal plagues of Egypt—namely, ankylostomiasis, bilharziasis, and *Tænia nana* infection—which were diseases of the agricultural rather than the urban districts. The Egyptian native was very amenable to treatment and ready to avail himself of it when brought to him by the travelling hospital, but he was unwilling to go out of his way to obtain necessary relief.

SECTION OF LARYNGOLOGY.

EXHIBITION OF CASES AND SPECIMENS.

A MEETING of this section of the Royal Society of Medicine was held on May 6th, Dr. W. JOBSON HORNE presiding.

Abduction Paralysis in Exophthalmic Goitre.

Mr. T. B. LAYTON showed a middle-aged woman, the subject of Bilateral Abduction Paralysis associated with Exophthalmic Goitre. For the goitre she had been under observation and treatment since 1895. She had diphtheria in 1887, and she still continued to have attacks of sore-throat.—Sir JAMES DUNDAS-GRANT suggested that the symptoms may have been due to pressure exerted by the enlarged thyroid gland on the sympathetic nerve.—The PRESIDENT said that surgical interference was usually blamed for such paralyses when there had been an operation for the condition, but in this case there had been no surgery. He agreed with Mr. E. D. DAVIS and Sir WILLIAM MILLIGAN in the rarity of such paralysis in exophthalmic goitre.

Suppurative Sequelæ of Scarlet Fever.

Mr. LAYTON and Mr. J. F. O'MALLEY showed cases of this kind. Mr. Layton's case was one of frontal sinusitis in a child, aged 12, which came on in the course of scarlet fever. There was a subperiosteal

abscess. The bone beneath was healthy, but a track led down to the front of the inner wall of the orbit, where the pus had escaped from the ethmoid cells through the lacrymal bone. The frontal sinus was full. An ugly scar resulted. Mr. O'Malley's case was one of bilateral subperiosteal suppuration of the orbit, due to ethmoidal suppuration, which had supervened during the scarlet fever. His operation of drainage of the ethmoidal region caused the swelling to subside, but did not quite eradicate the ethmoidal disease.—Sir WILLIAM MILLIGAN related a case which had had a number of operations done on the continent unsuccessfully, leaving gross disfigurement. After his own successful operation he greatly reduced the deformity by means of a pure gold plate, which was found by X rays to be still in situ more than 12 years subsequently.

Tumour of Pharynx.

Mr. W. H. KELSON showed a young man with a Tumour in the Pharynx. He had been operated on for enlarged tonsils and adenoids, and had had treatment for antral, ethmoidal, sphenoidal, and frontal suppuration.—Other cases were also shown.

Reviews and Notices of Books.

A PHYSICAL INTERPRETATION OF SHOCK, EXHAUSTION, AND RESTORATION.

By GEORGE W. CRILE, M.D. Edited by AMY F. ROWLAND, B.S. London: Henry Frowde and Hodder and Stoughton. (Oxford Medical Publications.) 1921. Pp. 232. 25*s*.

IN this work Dr. Crile has collected the evidence concerning shock accumulated during the last few years by himself and his fellow workers. He attempts to show that the degree of shock is proportional to the extent and duration of injury and to the richness of the nerve-supply in the injured part; that regional nerve-blocking or cocainisation of the bulb and spinal cord is effective in preventing its onset; that "trauma alone or sufficient strychnine alone causes exhaustion of the vaso-motor centre" after producing preliminary stimulation; and that this stimulation does not occur in the unshocked animal if the bulb and cord are anæsthetised with cocaine. Dr. Crile puts forward the evidence of changes in the brain cells, through a hyperchromatic stage to final disintegration, which result from trauma, but which, he says, do not occur "if the trauma is limited to territories disconnected from the brain by section of the spinal cord or by local anæsthesia." He again places on record his observations with Dr. Dolley on "Anæmia and Resuscitation," and notes the important fact that the brain-cell changes are "in certain respects identical with those in shock." The minute morbid anatomy of the brain, liver, and adrenals in experimental insomnia is described, together with the restorative effects of sleep, morphia, and nitrous oxide anæsthesia. According to Dr. Crile, similar changes occur in these organs after severe exertion, emotion, infection, hæmorrhage, starvation, asphyxia, chloroform, and ether anæsthesia, electrical stimulation, the administration of adrenalin, excessive thyroid feeding, and finally after the excision of the adrenals, thyroid, or liver. Changes in H-concentration and reserve alkalinity in these conditions are briefly mentioned, and, lastly, the results of certain observations of the electric conductivity of the brain, liver, and other organs are given.

This mass of evidence requires extremely careful and critical study, and it is unfortunate that the form in which it is put forward does not lend itself to such inquiry. For instance, Fig. 57, on p. 68, is supposed to demonstrate increase in the output of adrenalin due to the presence of foreign protein, whereas the only inference that can legitimately be drawn from the data presented is that the blood of the pregnant cat sometimes contains a demonstrable amount of adrenalin. Again, Fig. 58, on p. 69, is a tracing intended to show the effect of anaphylaxis in causing increased output of adrenalin and the influence of morphia in preventing such change. The legend refers to "the injection into a morphinised animal of beef serum, which in the normal animal would have caused a strong anaphylactic reaction." There is no reference to any previous sensitising injection, and, on the face of it, it appears that the author regards the effect of a single injection of foreign protein as equivalent to an anaphylactic reaction. Some of Dr. Crile's passing comments are also disquieting. On p. 70, for example, he says:—

> "In cases of suboxidation and asphyxia the outstanding phenomena are diminished voluntary muscular activity and diminished mental activity. In contrast, however, there is increased respiratory activity. If our explanation of these phenomena is that they are due only to the want of oxygen, then why is not the activity of the respiratory system diminished for the same reason?"

Dr. Crile seems for the moment to have forgotten the important part played by increased partial pressure of CO_2, and by changes in H-concentration, in the regulation of the respiratory centre, also that anoxæmia is not the sole factor in asphyxia. Finally, we cannot admit the validity, even as collateral evidence, of the observations made on the electrical conductivity of presumably dead tissues, in the investigation of the functional changes of living cells.

In his discussion of the ætiology of shock and exhaustion the author describes various theories put forward. He ignores the work of the Special Investigation Committee on Shock and Allied Conditions, set up by the Medical Research Council,[1] and dismisses in a few words the evidence that in shock the effective blood volume is diminished by the collection of blood in widely dilated capillaries, which are not, as far as we know, directly under the control of the central nervous system. The brain-cell changes which he describes may equally well result secondarily from anæmia. In his attempt to demonstrate the preponderating importance of a primary assault on the central nervous system in shock, Dr. Crile brings forward a great deal of evidence, some of which is highly dubious—for example, the work of Alexander and Cserna[2] on the oxygen consumption of the brain. He regards the anæsthetic action of nitrous oxide as being wholly dependent on its interference with the use of oxygen by the brain cells, and has apparently overlooked G. T. Kemp's[3] work in this regard. He refers, on p. 119, to the fact that "the brain cells have no basal metabolism except that of energy transformation, associated with work," but on the previous page he states, on the authority of Mathews, that "sugar is burned in the brain." Whether this occurs only during consciousness he does not say. It is, however, in his presentation of an "electro-chemical" hypothesis as to the method of exhaustion that Dr. Crile departs furthest from the fundamental data of physiology. His assumption that the brain cells are electric batteries and the nervous impulse neither more nor less than an electric current is untenable and can only lead to confusion.

The book contains so much interesting material that it is a matter of regret that Dr. Crile did not give more experimental details in order to permit of intelligent comment and criticism, instead of complicating this difficult subject by the presentation of hypotheses impossible to verify. The volume is excellently printed and the illustrations are satisfactory, though some of the blood-pressure tracings would be easier to analyse if the writing upon them were not too small to be decipherable without the aid of a hand lens. A useful bibliography is appended.

CATALYSIS AND ITS INDUSTRIAL APPLICATIONS.

By E. JOBLING, M.C., A.R.C.Sc., B.Sc. London: J. and A. Churchill. 1920. Pp. 144. 7*s*. 6*d*.

THIS volume is the second edition of one of a series of text-books on Chemical Research and Engineering, edited by Mr. W. P. Dreaper. Berzelius, as long ago as 1835, defined as "catalytic" the phenomenon that

[1] THE LANCET, 1919, ii., 159, 1153.
[2] Alexander and Cserna: Bioch. Zs., 53, 100-115.
[3] G. T. Kemp: Brit. Med. Jour., 1897, ii., p. 1480.

many chemical reactions which proceed slowly may be accelerated by the introduction of some foreign material. Since that time great and important advances have been made in chemical industry by means of catalytic agencies. The literature on the subject is voluminous, and Mr. Jobling has rendered a service to chemists in preparing this volume, for it will appeal both to the student and to those who desire a readable account of the technical applications of catalysis. The chapters on sulphuric acid manufacture, industrial chlorine, and fixation of atmospheric nitrogen are of particular interest, as is also the one dealing with the most recent offspring of catalysis—viz., the hydrogenation of fats.

The style of writing is lucid. A useful feature is a list of references, including patents and bibliography, at the end of each chapter.

DISEASES OF THE STOMACH.

Diagnostik und Therapie der Magenkrankheiten. Seventh edition. Von Professor Dr. I. BOAS. Leipsic: G. Thieme. 1920. Pp. 671. M.138.5.

TO any who are not familiar with Professor Boas's name as a European authority upon diseases of the alimentary canal the fact that this volume is the seventh edition of a work which first appeared 30 years ago is evidence enough of the lifelong interest and experience of the author in that province of medicine. Much progress has been made in 30 years; indeed, the student of human nutrition who has followed his subject over that period has known intellectual adventures of rare quality. He has seen the principle of the conservation of energy applied to man; has watched chemical, physical, and surgical methods transform the study of abdominal disease from a morass of inaccurate generalities to a cultured field of medical science; he has seen, most unexpected of all, the gigantic experiment of the rationing of nations; and, lastly, has looked upon the spectacle of the under-nutrition of half a continent. Most changes have their drawbacks, even changes for the better; and the disadvantage of the application of chemistry, physics, and surgery to the diagnosis and treatment of disease is that the doctor is sometimes apt to allow the test, or the photograph, or the operation to take the place, in whole or in part, of that careful study of the history, symptoms, and signs which was, is, and must be the basis of his work. Professor Boas's book will counteract any such tendency. It is full of clear common sense as well as accurate knowledge of clinical medicine and laboratory work.

The first part treats of general methods of investigation. A good account is given of the tender points which the author has described near the spine in diseases of the stomach and gall-bladder. Tenderness on deep pressure to the left of the spine between the tenth dorsal and first lumbar vertebræ, usually opposite the twelfth dorsal, suggests gastric ulcer. With pyloric and duodenal ulcers there may be a tender spot to the right of the spine. With gall-stones the tender point is two or three fingers' breadth to the right of the twelfth dorsal vertebra and may be as far out as the posterior axillary line; it may persist for weeks or months after an attack of biliary colic. The difficulty of not knowing how hard to press is got over by the use of the algesimeter, which records the pressure against a spring. A normal man bears 5 to 10 kilogrammes with this little instrument, whereas tenderness is elicited at the pressure point in a case of gastric ulcer with 3 kilos. The description of chemical methods is excellent, but that of X rays is inadequate. It is clear that, though the author makes use of X rays and shows some plates, he has not had the advantage of close coöperation with a good radiologist. For example, 2½ pages are devoted to methods of blowing up the stomach with air or other gas, 15 pages to dietetic methods of determining the motor power, and only 5 to the general description of the use of X rays: although the barium meal offers the quickest, safest, and most informing way of finding out the shape and motor power of the stomach. In the account of the various forms of gastroscope, coloured pictures are given of the appearance of the gastric mucous membrane. The author does not think that the last has been heard of this instrument, although radiology has put it in the background for the time. He agrees with most workers that the limits of gastric acidity in normal people are fairly wide, 0·15 per cent. to 0·2 per cent., also that a high figure may be obtained in those who have no symptoms, especially in heavy smokers and people who consume much meat and condiments.

The second part of the book is devoted to general methods of treatment. Of these diet occupies much space, the teaching being substantially that of the author's Special Dietetics, recently reviewed in these columns. Of other methods of treatment described baths, massage, electricity, poultices, stomach washing, and medicines are all dealt with systematically.

The last part, dealing with special diseases, contains much interesting matter. The importance of diagnosing achylia or subacidity, the symptoms of which are sometimes misleading, is referred to. 16 per cent. of 3147 chronic dyspeptics were found by Kelling to be suffering from this disorder. Such figures, however, must not receive too much attention, for an up-to-date X ray examination or an exploration would probably have shown that some of these were not the subjects of simple achylia. In writing of hyperchlorhydria, the view is put forward that some cases with symptoms but without ulceration are suffering from small erosions. The author notes that treatment commonly leads to disappearance of symptoms, although the hyperacidity as shown by test meals is unaffected. This is in complete accord with the best experience; we should look upon the presence of hyperchlorhydria as a valuable guide to treatment rather than as a condition which can be altered in a short time. Professor Boas would exclude salt from the diet, but regards the measure as of temporary benefit only. Sodium bicarbonate has been found to lessen secretion when given in small doses on an empty stomach, though, when given with food, secretion is increased, probably because of the production of sodium chloride and carbon dioxide. He is, on these grounds, against the taking of bicarbonate at the height of secretion, saying, however, that it may be useful during the healing of an ulcer. Alkali should, as a rule, be taken in small doses before food, though he does not think that it can systematically diminish the secretion of HCl. The form recommended is a mixture of bicarbonate of soda and magnesia, with reduction of salt in the food. He is doubtful about atropin, but recommends Merck's magnesium perhydrol in ½-g. doses, which in the acid stomach forms magnesium chloride and peroxide of hydrogen, the latter decomposing to water and oxygen. In gastric ulcer a distinction is drawn between the treatment of a simple ulcer and of the general liability to ulceration, the "ulcer disease." The treatment of the latter must be over a long period, and is needed whether the simple ulcer is operated upon or not. In about half the cases medical treatment does not lead to a permanent cure. It should always be tried first, except in patients who cannot afford the necessary time or money, or who cannot get suitable diet. Gastro-enterostomy is recommended for pyloric ulcer, and resection, if the technical difficulties are not too great, for ulcer of the body of the stomach. The author says occult blood is commonly present after gastro-enterostomy.

The X ray diagnosis of cancer of the stomach is inadequately described; for example, the characteristic rapid emptying with a gaping pylorus in cancer of the body is not mentioned. In the chapter on gastrocoloptosis the relation of this condition to a general asthenia is given prominence, and wise and sound rules are laid down for treatment. The author does not recommend operation by stitching up the stomach or the bowel—first, because in nearly all cases suitable treatment by appropriate feeding, rest, massage, &c., leads to relief; and, secondly, because dropping of these organs is, as above mentioned, frequently part of a general condition which operation does not benefit. Even after stitching is done the same general treatment has to be carried out for the same length of time

as if the operation had not been done, if a good result is to be secured. The diagnosis and treatment of numerous forms of gastric neurosis are described carefully, a useful classification being adopted into neuroses with one symptom—such as anorexia, nausea, pain, rumination, excessive peristalsis—and neuroses with more than one symptom.

This book is written from a broad and sensible standpoint and contains an unusual amount of close observation and wise advice. The author refers to several French authors, but appears to be almost unacquainted with contemporary British and American work, a neglect which may be due in whole or part to the inaccessibility of foreign books.

GYNÆCOLOGICAL AND OBSTETRICAL TUBERCULOSIS.

Gynæcological and Obstetrical Monographs. By CHARLES C. NORRIS, M.D., Associate in Gynæcology, University of Pennsylvania Medical School, &c. London and New York: D. Appleton and Co. 1921. Pp. 356. 21*s*.

Dr. Norris believes that tuberculosis of the female genital tract and peritoneum is of frequent occurrence, but that it is usually secondary to tuberculosis elsewhere. After a short historical sketch he considers the diagnosis by laboratory methods, and concludes that histological examination is usually sufficient, but that in doubtful cases animal inoculation should be carried out. A chapter is then devoted to the pathology of the chief forms of tuberculosis in the various parts of the genital tract, followed by a very interesting survey of congenital and placental tuberculosis. The conclusion is come to that these are very rare conditions, and that, for a congenital hæmogenic infection to occur, a maternal bacillæmia and a permeability of the placenta must be present. The disease is believed to arise in four ways: (1) by direct infection through the blood stream, (2) by direct infection from without, (3) by extension of a near-by focus, or (4) by a lymphatic infection. Tuberculosis affecting the various parts of the genital tract is considered in detail, and a large number of useful case-histories from the literature and from Dr. Norris's own experience are given. There is an instructive chapter on the important subject of pregnancy and tuberculosis. The writer maintains that in the presence of an extensive lesion, even in the quiescent stage prior to the fifth month of pregnancy, the uterus should be emptied. After the fifth month, however, little can be accomplished other than general hygienic and dietary treatment. As a general rule it is best to hasten the labour by applying forceps when the cervix is fully dilated.

The final chapters deal with the menstrual disturbances in pulmonary tuberculosis, the dangers of operations in this disease, tuberculous disease of the breast, and tuberculosis of the peritoneum. An analysis of 2356 cases of the latter condition treated surgically show some 31 per cent. permanently cured, 30 per cent. definitely improved, and 36 per cent. with recurrence, the development of tubercle elsewhere, or death from intercurrent disease. The book is a valuable contribution to the literature of this important subject.

MARGARINE.

Monographs of Industrial Chemistry. By WILLIAM CLAYTON. London: Longmans, Green, and Co. 1920. Pp. 187. 14*s*.

IN this volume the author has given a clear account of the modern processes involved in the manufacture of margarine. The methods of analysing the finished product and its constituents and the chemical properties of these are described, and butter, renovated butter, and lard compounds are also dealt with. A chapter on nutritional chemistry will doubtless be perused with considerable interest by our readers, as in it the results of the investigations on vitamins so far as they affect butter and its substitutes are discussed. Butter preeminently is the source of the essential "fat-soluble A" vitamin. The oleomargarines, containing 50 per cent. of beef fats, are good substitutes for butter, and their value in this respect is improved by admixture with butter itself to the legal limit of 10 per cent. Most oleomargarines contain lard, which is known to be devoid of "fat-soluble A," and it follows, therefore, that the animal fat portion of an oleomargarine should not contain lard. Vegetable oils and fats, and hydrogenated oils are lacking in this vitamin, so that the "vegetable" or "nuts and milk" margarines are not substitutes for butter from the true dietary point of view.

The author has rendered a service to technology in preparing this volume. Margarine has come to stay and its cheapness and ease of manufacture render it a formidable rival to butter. The product is capable of considerable improvement, particularly in the matter of texture and flavour, but in view of the great amount of technical investigation, which, to judge from this volume, is being directed to these points, there is every hope that margarine in the near future will be indistinguishable by the palate from butter. Mr. Wilson has included a number of good illustrations and a useful bibliography.

THE THINGS WHICH ARE SEEN.

A Revaluation of the Visual Arts. By A. TRYSTAN EDWARDS, M.A. London; Philip Allan and Co. 1921. Pp. 354. 18*s*.

THIS is a very interesting book, and one which gives occasion for much thinking, even though we may not always agree with the author's ideas. He deals, as is clear from the title, only with the *visual* arts, music and literature being excluded. He arranges the visual arts in the following order: first, the cultivation of human beauty; second, the art of manners; third, the art of dress; fourth, architecture; and fifth and sixth, the minor arts of painting and sculpture. This order, though it may give offence, he admits, "to many who are accustomed to arrogate to themselves the title of artists, can be shown to be in complete accord with the judgment of mankind, with that mature judgment which best finds its reflection in the opinions of the average man." The reader will ask himself who is the average man intended in the quotation, and Mr. Edwards does not tell us definitely. But he makes obvious who he is not: he is not the representative of public opinion. We endorse this view that the real preferences of the vast majority of people are shown, not by what they say or are taught to say, but by what they do; whence it follows that, by examining the deeds which men perform and the conventions established among them, we can obtain a more accurate idea of our fellowmen than can be obtained from any attention to the expressions of sentiment heard on all sides. Mr. Edwards's thesis is that the value of the arts is in direct relation to their benefit to society, and he places the cultivation of human beauty in the first place, because a high general standard of beauty will not be achieved unless the social virtues are practised.

In a general review in the first portion of the book Mr. Edwards refers to his omission of literature and music, and with regard to the latter art makes a statement with which we cannot agree: "Rhythm and melody can never give complete satisfaction to the average man unless they are brought into direct relation with human life by being associated with a song or a dance, a theatrical or operatic display, or some form of ceremonial." We own that it is difficult for any one of us to say what may completely satisfy his neighbour, but we have seen a packed audience standing in the area of Queen's Hall on a hot August night listening with delight to Bach's concerto for two pianos in C major, and demanding the repetition of the brilliant fugue with which the work concludes; the performance did not come under any of the heads mentioned by Mr. Edwards. Such artistic triumph can have no relation to successful effort; and as the art of music was definitely left out of the scope of the work, it might have been better not to drag it in with any comment.

The second part of the book deals with form and subject and the grammar of design, the latter involving number, punctuation, and inflection; and this section will be found by many of our readers the most interesting part of the work. Mr. Edwards's remarks upon duality and plurality will make many persons realise what they have probably not realised—namely, that where pairs exist in the human body the duality has been resolved—e.g., the two hands are really each of them one-half of unity. Humpty Dumpty discoursed to Alice about her face, saying, "Your face is the same as everybody has—the two eyes so (marking their place in the air with his thumb), nose in the middle, mouth under. It's always the same. Now if you had the eyes on the same side of the nose, for instance, or the mouth at the top—that would be some help." "It wouldn't look nice," Alice objected, but Humpty Dumpty merely shut his eyes and said, "Wait till you've tried." Few of us could say offhand why it would not look nice, but having read Mr. Edwards's book we know that such an arrangement would violate the canons of number, punctuation, and inflection.

Mr. Edwards shows less than his usual acumen when he refers to "doctrinaires, according to whose view it is wrong to adopt in England the architectural forms indigenous to ancient Greece or Rome," who "show the same kind of affectation as do those literary purists who go out of their way to avoid all words of Latin origin." To our mind, the architectural forms of Greece and Rome are unsuitable for England on account of climatic differences. Windows are a monstrosity in a classical building, and so is a high-pitched roof, both of which are necessary in a northern climate. It is just as bad to transport northern architecture to a southern climate, as may be learned in Seville Cathedral.

Although we cannot always see eye to eye with Mr. Edwards, we have found his book capital reading. It is well written, widely informed, and often original in a stimulating and pleasing way. Those who study it will find their personal powers of observation quickened and their desire to see things correctly made more keen.

In many directions the book will be of particular interest to medical men.

SYPHILIS AND VENEREAL DISEASES.

Fourth edition. By C. F. MARSHALL, M.D., and E. G. FFRENCH, M.D. London: Baillière, Tindall, and Cox. 1921. Pp. 434. 25*s*.

THIS fourth edition has been revised throughout and a considerable amount of new matter added. The result is a valuable book, for not only does it contain excellent descriptions of venereal diseases and the routine methods of their treatment, but the teaching is practical and should help the practitioner to deal with all the stages of the diseases and their complications. Special emphasis is laid on the necessity of a clinical diagnosis as opposed to a pathological one; the tendency to rely on the pathologist in these days is great, and it is refreshing to find responsible writers who urge the medical man in charge of a case to begin by using his own powers of observation. The pathology, however, is not neglected.

The authors hold, and we agree with them, that a case of syphilis should not be submitted to a routine treatment, but that more attention should be paid to each individual, whose temperament, amongst other things, requires to be fully studied. A long course of mercurial treatment is strongly advocated; reliance on the arsenical preparations has been carried too far. The advantages and disadvantages of the various methods of treatment are fully discussed. The desirability of using potassium iodide in preference to any of its substitutes is emphasised: at the present stage of our knowledge there can be little doubt as to the wisdom of this advice. In common with most syphilologists the authors believe that the harmful effects of salvarsan have been much exaggerated. They attribute the ill-effects to the improper surroundings of the patients, and especially to a cold atmosphere; but as in most large clinics salvarsan treatment is used on out-patients at all times of the year, while the cases of poisoning are not numerous, we do not find this idea quite probable. Intramine is found to be a useful drug in the treatment of salvarsan poisoning.

Congenital syphilis receives adequate consideration; the diagnosis and treatment of gonorrhœa in all its stages are thoughtfully set out, but the tests for establishing the fact of cure are not very clearly described and might in future editions be elaborated. This book is deservedly popular. It is well got up and the illustrations are adequate.

ESSENTIALS OF MEDICAL ELECTRICITY.

Fifth edition. By ELKIN P. CUMBERBATCH, M.A., B.M., B.Ch. Oxon., M.R.C.P., Medical Officer i/c of the Electrical Department, St. Bartholomew's Hospital, &c. London: Henry Kimpton and Co. 1921. Pp. 388. 10*s*. 6*d*.

WE welcome a new edition of Dr. Cumberbatch's excellent book on medical electricity. Since its modest beginning in 1905, when the whole subject was in a state of flux, each succeeding edition of this work has steadily progressed in value. During this period the theory and practice of electrical work in medicine have undergone modifications, to an extent appreciable when we compare the present edition of Dr. Cumberbatch's treatise with the first edition—indeed, the development of medical electricity can be traced through the series.

This last volume differs in no essential particular from those that have gone before. The necessary additions have been made. Treatment of deep-lying organs has been reconsidered in view of the growing belief that it is not possible to introduce ions far below the surface by the galvanic current. It is far more probable that the good effects of such applications are due to a shifting of the ions within the tissues than to any introduced from without. Reference is made to the use of slowly varying currents, including the variety known as three-phase, where the variations between three electrodes follow a regular progression. The author's valuable work on diathermy is here brought up to date, with the addition of notes on the treatment of gonococcal infection by raising the temperature of the affected parts.

The book in its present form remains a handy and safe guide to the medical application of electric current.

DIE CHIRURGIE DER PERIPHEREN NERVENVERLETZUNGEN.

Mit besonderer Berücksichtigung der Kriegs-Nervenverletzungen. Von Privatdozent Dr. WALTER LEHMANN. Berlin: Urban and Schwarzenberg. 1921. Pp. 270. M.81.

THIS monograph combines the author's own experience of injuries of the peripheral nerves during the war, with a critical review of the methods and results of other surgeons in Germany. In size it is comparable with Tinel's well-known "Les Blessures des Nerves," but, as is natural in a work written after rather than at the beginning of the war, it devotes a larger space to treatment and results than to clinical syndromes. The book contains three parts, which are divided into 11 sections and 38 chapters. The first part deals with the pathological and clinical sides of nerve injuries, the second with prognosis, treatment, and results, and the third with the ætiology, symptoms, and treatment of injuries to special nerves. A list of 660 references arranged under the number of the chapter to which they belong occupies 30 pages at the end of the book. The literature quoted is almost entirely German, only nine foreign contributions being included. Although 349 of the papers referred to were written during the war, no reference is made to any foreign journal later than 1910.

On the whole, the problems of this chapter of war surgery seem to have been dealt with on the same lines as in this country, and with very similar results. In the section on Prognosis and Treatment of Nerve Injuries and their Results a chapter is devoted to the various materials and methods used for protecting nerves after

suture or freeing. Calf's artery, prepared by the formalin method of Foramitti, is spoken of favourably, and seems to have been widely used in Germany. One section is devoted to the operative methods for bridging large gaps in nerves and their results. Gradual lengthening and suture by means of a two-stage operation is praised, but no ultimate results are quoted. As in this country, there have been only a few successful end results from nerve grafting and similar procedures. An extraordinary implement called a nerve winder, designed by Bethe, for gradually stretching a nerve is depicted on p. 130; the obvious defects of this apparatus are pointed out by Dr. Lehmann.

This work does little to advance our knowledge, but should nevertheless be read by those who wish to know what has been done in Germany in this branch of surgery during the war.

INTRODUCTION TO PHYSICAL CHEMISTRY.

Einführung in die Physikalische Chemie für Biochemiker, Mediziner, Pharmazeuten und Naturwissenschaftler. Von Dr. WALTHER DIETRICH. Berlin: Julius Springer. 1921. Mit 6 Abbildungen. Pp. vi. + 106. M.20.

IN this volume the subjects of osmosis, dissociation, equilibrium, hydrogen-ion concentration, surface phenomena, and colloids are discussed in a very elementary fashion, evidently as introductory to a fuller study at a later date in the student's course. The subject-matter is usually adequately treated in our text-books of physiology and biochemistry, and medical students at least will hardly need another account. The chapter on hydrogen-ion concentration may, however, be of assistance, for students generally find it difficult to get a clear understanding of this very important part in the life processes. The chapter on surface phenomena may also be read with advantage. Otherwise we may say that the description of osmosis is far too long and of colloids far too short.

CHEMISTRY OF ENZYME ACTIONS.

By K. GEORGE FALK, Harriman Research Laboratory, Roosevelt Hospital, New York. American Chemical Society Monograph Series. New York: Chemical Catalog Company, Inc. 1921. Pp. 136.

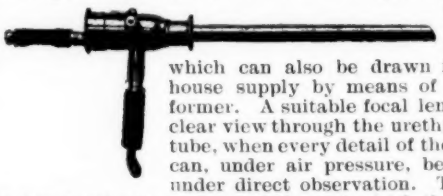
IN this monograph the author discusses enzyme action from a chemical rather than the more usual physical standpoint. As enzymes are catalysts produced by living matter, they should, of course, be studied from both aspects. Special emphasis is laid upon the chemical nature of enzymes themselves. The purest preparations have always been found to contain nitrogen: most enzyme preparations contain about 15 per cent. of nitrogen, but sucrase is an exception in its content of about 2 per cent. only. Horse radish peroxidase appears to be a nitrogenous glucoside. Even though we cannot as yet locate enzymes amongst a definite group of organic compounds, an idea may perhaps be gained of the chemical structure of that part of their molecule which is effective in producing the catalytic action. In this connexion special study has been made of the action of lipase, and we can locate its action in the CO – NH grouping of proteins and its tautomeric form of C(OH) = N –. The chief factor in enzyme action is adsorption with the substrate or products of the reaction. Instead of adsorption being a purely physical process, the author regards it as being primarily a chemical one, corresponding to the addition process of general chemistry. Combination only occurs if the chemical groups can interact to form the adsorption compound.

These are the chief points in the book, though other chemical analogies are mentioned as of some possible importance. They might with advantage have been developed at greater length, and less space devoted to the pure physical chemistry. The long preamble to every chapter with constant repetition of contents of previous chapters is quite unnecessary.

New Inventions.

THE G.P. URETHRAL AURORASCOPE.

THE instrument here illustrated is not original, as similar instruments in the main are fairly well known to specialists. The head of the instrument contains an electrical circuit leading to an internal lighting bulb. The light is obtained by means of a simple dry battery of 3 to 4 volts power, which can also be drawn from the house supply by means of a transformer. A suitable focal lens gives a clear view through the urethral metal tube, when every detail of the urethra can, under air pressure, be brought under direct observation. The head is also fitted with a stop-cock through which the urethra is inflated by means of rubber bellows. By interchanging the eye-piece for one of my own design a probe of cotton-wool can be moistened with any caustic and passed through the opening in the lower segment of the operating optical eye-piece. The exact location of the disease being in view, direct pressure is made on the proximal end of the probe, which allows sufficient play for the distal end to protrude through the urethral tube and touch the diseased area. Various sizes of urethral tubes are supplied.



The instrument will do the work of the most expensive urethroscope, and has been made for me by the Aurorascope Co., Ltd., Fulwood House, Fulwood-place, Holborn, W.C., where it can be seen and tested. The price is £4 4*s*., operating optical eye-piece 10*s*. 6*d*. extra, and it is fitted in a leather pocket-case measuring $9 \times 4\frac{3}{4} \times 1$ inches. HENRY DUTCH, M.D.

CARNEGIE UNITED KINGDOM TRUST.

THE seventh annual report of the Carnegie United Kingdom Trust has recently been issued, dealing with the year ending Dec. 31st, 1920. During this period the work of the Trust was considerable, for although conditions were still very different from those of pre-war days (notably as regards building operations), there was an improvement on the stagnation obtaining in 1919. The section of the report devoted to physical welfare deals with the subject under four headings—central institutes, play centres, model centres, and published reports. With reference to the trustees' offer to provide £40,000 each for two central institutes for infant and child welfare, the report states that local difficulties have prevented action in Edinburgh, but that preliminary steps had been taken towards the establishment of the London institute; the only practical alternative to abandonment of the whole project was found to be the securing of a leasehold property (No. 117, Piccadilly), a building suitable for the purpose and conveniently situated, to house the Central Institute proper, together with its constituent child-welfare societies, and probably also the Incorporated Institute of Midwives. The grant of £40,000 will cover the whole cost of lease, equipment, and sinking-fund charges. Grants have been promised for six model centres, one of which—the Motherwell centre—is now in course of erection. Plans have been passed for the Shoreditch, Birmingham, and Liverpool centres, and it is hoped that building will soon be possible in these places. The plans of the Rhondda centre will probably shortly be submitted, the difficulty of obtaining a site having now been overcome; political and social conditions have prevented any movement to establish the Dublin centre, and the corporation of the city may invite the trustees to modify the project or abandon it altogether—a course which would be particularly unfortunate, since child-welfare work is very urgently required in Dublin. Very few applications have been received for the establishment of play-centres, and some of them when received had to be refused, as the centres were to be administered by voluntary bodies and not by competent local authorities. A considerably increased grant has been approved for the Blackrock centre, and a provisional grant has been promised to the Borough of Norwich. At Chester it has been decided to acquire a new site for the projected centre. It has been decided that two further reports might usefully be published—one, a summary of laws dealing with powers of local authorities regarding physical welfare; the other, a report on the ideals to be aimed at in setting up child-welfare centres—and their preparation is under consideration.

THE LANCET.

LONDON: SATURDAY, MAY 21, 1921.

The Ministry of Health.

AT the end of last week Sir ALFRED MOND, on the vote to meet expenses in connexion with the Ministry of Health, made a statement in respect of the present position and future intentions of his department, which has produced an excellent effect both within and without the House of Commons. For although the sum asked for was a very large one, the explanation of huge work ahead of the Ministry of Health led to an agreement to the vote without any damaging criticism, while the public learned that the Ministry has been, and is, working along definite lines to promote and correlate efforts in behalf of the public health. Considering the vague and various attacks that have been made on the Ministry of Health for political purposes from its quite early days, this may be regarded as a very healthy state of affairs; as the public ignorance, which has been exploited by irresponsible public statements, disappears, the real economy of spending money in the prevention of disease will become clear.

The Minister of Health began by pointing out the perfect absurdity of drawing any comparison between the estimates in connexion with the Local Government Board in and before 1914 and those of the Ministry of Health at the present moment. All such comparisons have been transparent nonsense to those who know, and remember, how the Ministry of Health came into being, and what numerous activities it represents other than those of the old Local Government Board. Nor is this the whole story. New programmes of work, considered by neither the old Local Government Board nor by any of the departments whose functions have been transferred to the Ministry of Health, have been added to the designs of the Ministry, while the administration of the National Insurance Commission, which was dislocated by the war before it had received proper trial of its possibilities, has called for large reconsideration. And if comparisons between the numbers and spheres of work of the medical staff of the old Local Government Board and that of the new Ministry of Health cannot be drawn, it becomes waste of time to debate whether that medical staff, when alluded to as "medical officers," implies only "medical officers" as distinct from "medical inspectors," or implies the medical staff as a whole. In the House of Commons Dr. ADDISON stated, during the debate, that under the Local Government Board in 1918 there were already 38 medical officers. The statement was perfectly true, and not a person ought to have been deceived into thinking that he meant 38 heads of groups and sub-groups, under whom medical inspectors worked. He was clearly including the "medical inspectors" under the term "medical officers," as is always done in conversation.

The actual figures, which can be fairly compared in order to show the relative position of the headquarters staff of the Ministry of Health in 1918 and to-day, are as follows:—

1918.		*1921.*		
Medical Officer	1	Chief Medical Officer ...	1	
Assistant Medical Officers	5	Senior Medical Officers...	6	
Medical Inspectors	23	Medical Officers—		
		General	43	
Med. Inspectors of Food	5	Food...	5	50
Med. Inspectors Poor-law	2	Poor-law	2	
Med. Bacteriologists ...	2	Med. Bacteriologists ...	2	
	38			
Insurance Medical Officers	8			
	46			59

Here is Sir ALFRED MOND'S statement on the matter, and it will be seen that it tallies both with the facts and with Dr. ADDISON'S figures:—

On April 1st, 1919, the number of pensionable medical men in the Local Government Board and the Insurance Commission of England and Wales was 46; the number at present in the Ministry is 59, or a difference of 13, distributed as follows: Maternity and child welfare, 2; tuberculosis, 2; venereal disease, 2; port isolation hospitals, 3; statutory medical services and intelligence work, 3; and work taken over from the Home Office, 1. These are additional functions to the work which is being looked after by the medical staff of the Ministry of Health, apart from the newly established regional officers. There are no less than 1800 sanitary authorities which look to the Ministry for guidance, 114 port authorities, 646 Poor-law unions, 1029 isolation hospitals for infectious diseases, and 4220 public vaccination districts which have to be inspected. There are a vast number of maternity centres and tuberculosis sanatoriums to which the Ministry give grants and which also have to be inspected.

This statement, which will be found in our Parliamentary Correspondent's report, should be remembered, when, in the future, the wholesale cutting down of the members of the medical staff of the Ministry of Health is under discussion on the score of economy. Colonel FREMANTLE, during the debate in the House of Commons, alluded to "a canard going round the press that the Ministry of Health inherited from the Local Government Board a staff of only four medical officers." He has since written to the *Times*, where the unfortunate announcement was made editorially in the course of a plea for economy, giving much the same comparative figures as those we print above. All advocacy of economy is welcome to-day, but its basis should be correct.

Three expressions of opinion and intention came from the Minister of Health, which revealed to the House of Commons a story of strenuous industry. He claimed that in spite of difficulties the department had succeeded in making a reduction of over £3,000,000 in the estimates of this year as compared with last year, while considerable progress had been made with housing schemes. And here he pointed out—what is now well known—that some local authorities have exaggerated local wants. The national need is grave enough without such troublesome errors. Secondly, in reply to points raised principally by Sir WATSON CHEYNE, Sir ALFRED MOND stated that there was no intention on the part of the Government to start a State Medical Service, although an endeavour was being made to improve the existing panel

systems in certain directions. We may hope that one of these directions will be the encouragement of all movements on the part of the Approved Societies to assist in the support of the voluntary hospitals. It was announced, on the very afternoon that the Minister of Health was speaking, that a number of beds in the London Hospital would have to be closed, and the Minister allowed that the position of these great charities was giving his department cause for anxiety; but recent action by the Approved Societies should have an encouraging influence here. These Societies have discussed with the British Hospitals Association the possibility of providing institutional treatment for their members, who form so large a section of the panel patients, in return for contributions on an agreed percentage basis, and if the voluntary system can be supported in this way on any general plan the relief to the charities should be great and promptly felt. Lastly, Sir ALFRED MOND defended the policy of the Government in respect to venereal disease, a policy directed towards official propaganda, but also towards the promotion of treatment. While he stated that he refused to accede to any demand to regard the question from a merely medical point of view, it is well known that a comprehensible policy in respect of the control of venereal disease, taking note of the therapeutic side, will shortly claim public attention. There is nothing new about such a policy, but for various reasons it has not been pressed forward by the Ministry, and medical men will agree that it is difficult, dangerous, and sometimes wrong for a Government department to lay down from the centre rules which cover therapeutic details. Indeed, it can be argued that a Government department acting along such lines would be "prescribing by correspondence," the mischief of which has been sufficiently illustrated by countless charlatans. Further, the Ministry of Health is bound to take into consideration the freedom of opinion of the local authorities working beneath its ægis. For this reason the Ministry can hardly go further in the definite treatment of venereal disease than to acquiesce in freedom of action on the part of those who represent the ratepayers. But medical men have learnt with pleasure that, in view of the prevalence of venereal disease, the Ministry proposes to offer public advice, pointing out the duty which lies on all individuals infected to take measures to purify themselves. It need hardly be added that those measures must be sufficient and must be prompt, or they will only constitute an imitation of protection. The duty of the Ministry is to help those who desire to help themselves; and the duty of the local authorities is to come promptly to a decision as to the methods which can be employed to such an end.

Prague as a Health Focus.

HEALTH conditions in Prague under imperial rule left much to be desired. It was difficult to obtain a trained nurse. In the large part of the town the drainage was inadequate, and the rough stone-paved streets in the older quarters were not kept free from garbage. Things are apparently improving. Set in the very midst of the European storm circle, the Czecho-Slovak Republic enjoys none the less some measure of the peace essential for any organised health effort. A number of voluntary health and social organisations have long existed in the Republic without any contact between each other, and now, at a meeting called by the Czecho-Slovak Red Cross, representatives of nine of the most active of these organisations have arranged to meet on a council in whose deliberations public health and social effort shall have their fitting place. Each organisation will preserve its independence, the council meeting four times a year for joint deliberation. A central office with a part-time secretary in the building of the Red Cross provides for the collection and circulation of information. The generosity of the International Health Board of the Rockefeller Foundation has made it possible to open this office at once on an experimental basis.

At the same time the Ministry of Public Health and Physical Education is making every effort to mobilise all forces against the spread of infectious diseases. This is a measure of wise precaution, although the general situation in Slovakia itself is not alarming. Neither the typhus epidemic nor the small-pox epidemic which were anticipated for the spring fulfilled the gloomy promise, and of the latter only scattered foci persist in Slovakia. No cholera has been reported. The Ministry has at its disposal a mobile column to fight epidemics, consisting of four motor-cars, one containing a laboratory, a second to accommodate personnel, a third for transport of patients, and a fourth containing disinfecting plant. Four nurses are attached to the unit, the chauffeurs are trained disinfectors, and a physician is in charge of the whole. The unit will at first operate in Slovakia along with a sanitary train lent by the American Red Cross to the Government. Proceedings will be made easier later by the passage into law of a Bill now before the Assembly for the administration of local health under a national service of officers. The measure was deemed necessary in order to secure an adequate medical and public health service for Slovakia, where the peasants are ignorant and greatly in need of medical and health services although unable to support their health officer locally. The nationalisation of some two thousand part-time health officers will increase the budget of the Ministry of Health by about 50 million crowns, but it will make it possible for the Ministry to send to Slovakia young Czech doctors who otherwise would not go there because they could not support themselves by private practice.

At the Ministry itself a new section has been organised for the study and reform of public health activities. The first task of this section will be to demonstrate the value of statistics and public health education in the programme of a would-be modern State. The section has two chiefs, one of them being Prof. SELSKAR M. GUNN, technical adviser to the Ministry, who represents the Rockefeller Board; the other Mr. KOLINSKY, who returned recently from a study trip to England and the United States under the auspices of the same Foundation. The personnel of this section will chiefly consist of doctors who have spent a year studying public health administration in the United States. An advisory board consisting of prominent men in the field of public health in Czecho-Slovakia has been attached to the section. The whole movement will be watched with sympathetic interest by the neighbours of the Republic, near or remote, who would like to see

at Prague a health centre from which the infection of true hygiene may radiate out into lands where plague centres are the rule. We hope the Little Entente, as the understanding between Roumania, Hungary, and Czecho-Slovakia has been termed, has included in its understanding a concerted campaign against epidemic disease.

Rickets and Vitamins.

IN the April number of the *British Journal of Experimental Pathology* Professor D. NOËL PATON and Mr. A. WATSON, after a brief recapitulation of their previous work on the subject, give a detailed account of further experimental investigations into the ætiology of rickets in pups. They use throughout pups from the same litters for comparative tests, as, in their opinion, the susceptibility of different strains is so varied as to invalidate statistics collected except on this principle.

The object of the first of the new series of experiments recorded has been to test the possibility of rearing dogs free from rickets, when confined in a laboratory, on diets: (1) rich in milk-fats, and (2) poor in fats supposed to contain an antirachitic factor. Both sets of pups developed rickets, but those on an abundant diet less rapidly. In order to ascertain whether this delay could be attributed to a decrease in susceptibility due to more ample energy intake, apart from the influence of any accessory food factor associated with milk-fat, a second series of experiments was undertaken. Pups from three litters were divided into four classes, in each of which the energy intake was kept ample throughout the whole period of growth mainly from one of the following sources: (A) Whole fresh milk and bread (2 pups); (B) whole dried milk and bread (3 pups); (C) separated milk, bread and lard (4 pups); (D) separated milk and bread (9 pups). Two of the pups in Class D were kept in a large kennel with an open yard, and were freely exercised every day; and in order to try and hasten the onset of rickets two others, also in Class D, were kept in a rabbit hutch from the age of 12 weeks to the age of 16 weeks. The rest were kept in a laboratory, a large sunny room with a concrete floor, in movable pens measuring 5½ ft. square. Very special precautions were taken to ensure cleanliness. Of these pups, one, in Class B, died at the end of the ninth week of the diet, not from rickets. One only, in Class D, of the remainder developed rickets. The conclusions drawn from these experiments by the authors are as follows:—

(1) In young dogs under ordinary laboratory conditions a liberal allowance of milk-fat, up to even 14 g. daily per kilo of body-weight, does not prevent the onset of rickets.

(2) Pups kept largely in the open air may escape the development of rickets on an intake of less than 1 g. of milk-fat per kilo of body-weight.

(3) With scrupulous care as to cleanliness it is, at least sometimes, possible to rear pups free of rickets in the laboratory on an intake of only about 0·5 g. of milk-fat per kilo of body-weight, along with bread, provided that the diet affords an adequate supply of energy.

(4) The energy value of the diet, however supplied, quite apart from the presence of any hypothetical antirachitic factor in milk-fat, would seem to play a part in controlling the development of rickets; but that it is only a contributory part is shown by the development of rickets in pups with a high energy intake if confined in the laboratory without scrupulous care as to cleanliness.

(5) Milk-fat may be reduced to about 0·3 g. per kilo of body-weight, if its place is taken by an equal amount of lard, without the onset of rickets.

(6) The results of these observations give no support to the conclusion of the Accessory Food Factors Committee of the Medical Research Council that rickets is a deficiency disease due to a lack of an antirachitic factor in the diet.

Much work on accessory food factors has been done since the publication in 1919 of the report referred to. With more knowledge distinctions have become less absolute. For example, Professor E. MELLANBY,[1] referring to the observations of HESS and UNGER, emphasises the difference in distribution of the fat-soluble factor and the so-called antirachitic factor in vegetable fats. He says that though cotton-seed oil is generally accepted as containing no fat-soluble A, in his experience it is one of the better vegetable oils in preventing rickets. And investigators are by no means agreed even on the presence or absence of fat-soluble A in any given foodstuff. Professor PATON, following most authorities, assumes that lard is considered vitamin-free, while quite recent work by Dr. J. C. DRUMMOND[2] differentiates between lard derived from grass-fed pigs and those fed on a diet deficient in vitamins. In the former he has found fat soluble A. Incidentally Professor PATON deduces from the first experiment quoted above that for experimental purposes "dried milk may safely be substituted for fresh milk." Dr. DRUMMOND classes their relative content of fat-soluble A as ++ and +++. Since quantitative results that cannot be expressed numerically are of doubtful value, not even the firmest adherents of the vitamin hypothesis could regard this as an important contribution to the question of the form in which milk ought to be supplied to children. We only mention it as a further sign of what an enormous mass of work yet remains to be done before the presence or absence of a vitamin from any foodstuffs, still less the ætiology of rickets, can be proved. In fact, those who are inclined to be quite bewildered by the conflicting results of different eminent observers in the same field can derive some help from a critical essay by T. B. OSBORNE and L. B. MENDEL.[3] These authors draw attention to the contradictions existing in the literature as to the presence or absence of a fat-soluble vitamin in a given experimental diet, and are inclined to attribute the discordant results of various workers to traces of this vitamin in certain diets generally considered free from them. However, they agree with Professor PATON in emphasising that the crucial experiment in which nutritive failure ensues immediately upon giving a diet deficient in this respect has not yet been done. They might have gone even further. Until a more accurate quantitative basis of estimating vitamin content can be attained the question must remain unsolved.

[1] THE LANCET, 1920, i., 857.
[2] Maternity and Child Welfare, May, 1921.
[3] Jour. Biol. Chem., 1921, 45, 277.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD.—Seventeen medical entrance scholarships and exhibitions of an aggregate total value of about £1580 will be offered for competition on Tuesday, June 28th. These are tenable in the faculty of medical sciences of University College and King's College, and in the medical schools of Westminster Hospital, King's College Hospital, University College Hospital, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital. Particulars may be obtained from the secretary of the Board, S. C. Ranner, M.A., the Medical School, King's College Hospital, Denmark Hill, London, S.E. 5.

Annotations.

"Ne quid nimis."

PURE AIR ON COMPULSION.

WE print in this issue a further instalment of monthly records of atmospheric pollution taking the risk of being convicted of a certain grim humour, for, with the disappearance from our cellars of the last fragment of bituminous coal, atmospheric pollution has become as extinct as jail fever or the black death or any such avoidable mediæval nuisance. The records show that in May of last year ten tons or more of solid matter descended on each square kilometre of the industrious metropolis, half a ton of this material consisting of tar and a further two or three tons of other carbonaceous matter. This present month of May, what dust there is in London has become clean like country dust, the rain descends without flecking with soot every white object on which it falls, and the famous vista along Park-street—Portman-street—Gloucester-place ends with a glimpse of the northern heights of almost Italian clearness. At the Meteorological Office the newest instrument has been rendered useless. This constrains London air to make its own dirty record, two litres of it being drawn through each of a number of small circles in a disc of blotting paper, which revolves once in 24 hours, the tint of the resulting stain being read off on a scale. The last week or two the stain is not there to estimate. In Manchester, where smoke is alleged to cost the citizens each year a million pounds in laundry alone, the whole aspect of the place has changed and cheers some of the oldest inhabitants with views unseen for half a century. These are the evidences which must needs bring conviction to the great public whom figures do not touch. The right place for products of incomplete combustion is in our chemical and dye works, where they are badly required. There is no sense in polluting with them the air we breathe, and now that city dwellers have been obliged by dire necessity to breathe pure air for a few weeks we may hope that they have acquired a taste for it which will survive the momentary crisis.

THE LOST ART.

IN his special pharmacopœia for medical men Sir James Mackenzie carries some stimulating drugs and some useful tonics, which though they may be a little bitter to the taste are certainly good "strengthening medicine." It is not pleasant hearing that during the last 100 years practically no progress has been made in the recognition of the origin of common diseases, nor that the art of prognosis, so important to the patient, has actually retrogressed; but these implications as expounded by Sir James Mackenzie are not easy to refute. The description of a specialist as an expert only in the treatment of the later stages of his speciality is hardly unfair, while the cherished belief of the public that accurate prognosis is within the power of the average medical man is belied not only by life insurance practice but in everyone's daily experience.

In his recent lecture at the Institute of Pathology and Research at St. Mary's Hospital, Sir James Mackenzie disclaimed at the outset any desire to belittle laboratory methods, of which he appreciated both the value and the limitations—and, indeed, his indictment of the laboratory worker was less severe than his censure of the training and the habits of the modern clinician. The training of the latter for his special work has, in truth, suffered grievously with the alteration of the medical curriculum during the last 10 or 15 years. The final years are almost intolerably crowded. Whereas in years gone by the student could spend, and was encouraged to spend, long hours in the wards studying his cases, he has now to pass in hectic progression from one class room to another. Every specialist, with the laudable fanaticism of his kind, insists on the importance of his subject, and demands that special courses of instruction should be made compulsory. In the sacred name of progress fresh claims are constantly being made on the remnants of the students' eight-hour day, and it is not difficult to visualise a future in which the medical graduate shall be so fully trained in every ancillary science pertaining to his art as to be able to do everything except apply his knowledge to the treatment of a patient. The thoughtful clinician is fully alive to the dangerous possibilities of such a state of affairs and from time to time complains that his art has been relegated to a position of secondary importance. But he himself cannot be absolved from blame. Fascinated by the new knowledge he has attempted to teach and practise it, not always with complete success, and in doing so has lowered his own calling. He has failed to maintain the paramount importance of clinical work, and to assume the position of interpreter of information supplied him in different languages by his colleagues. He has been prone to regard the laboratory worker as a machine who is there merely to give him a plain Yes or No to a plain question, seldom as a colleague consultant in the sick room. The consequence is that the clinician has lost or is losing his art, while the specialists are not placed in a position collectively to supplant him, even if that were possible or desirable. Sir James Mackenzie spoke somewhat slightingly of team-work, but real team-work should certainly have a trial, at least in teaching hospitals, before being condemned. Men who work in the laboratory must be encouraged to the bedside, since medicine cannot be divorced from the patient. We suspect that Sir James Mackenzie is not interested in experimental team-work mainly because he considers that the general practitioner, who cannot as yet obtain the advantages of proper collaboration, is being wrongly trained. He is asked to study physical signs instead of symptoms, to keep records of little value, to take meaningless histories. He cannot be taught what symptoms mean, which records are important, and how to take a valuable history. But this want of knowledge Sir James Mackenzie has set himself to supply, at least in part. In describing his efforts in this direction he delighted his audience with anecdotes at the expense indiscriminately of himself, of his guests at St. Andrews, and of his hosts at St. Mary's. In more serious vein he demonstrated the ways in which modern medical research had, in his opinion, taken a wrong turning, and this was the main theme of his discourse. Shrewd and yet kindly were his attacks on modern methods of medical education, their essential message appearing to us to be that the student requires more general and sympathetic shepherding along the course than he receives to-day.

ABRUPTIO PLACENTÆ.

ACCORDING to Dr. Edgar Snowden,[1] assistant obstetrician at the Columbia Hospital, Washington, who records an illustrative case, abruptio placentæ, or hæmorrhage occurring from premature separation of a normally implanted placenta, is one of the most serious complications of pregnancy. It was first described as long ago as 1776 by the elder Rigby, but it is only recently that its pathology has been studied with any degree of scientific exactness. The condition probably occurs more frequently than is generally supposed, as many mild cases pass unrecognised. According to statistics at various maternity hospitals its frequency varies from 1 in 92 (Rotunda, Dublin) to 1 in 600 (Chicago Lying-in Hospital). The most recent investigations show that toxæmia is the primary cause of the condition, the

[1] Journal of the American Medical Association, April 16th, 1921.

toxin being possibly of placental origin as suggested by Willson. The hæmorrhage may be apparent, the blood escaping under the edge of the placenta or through the cervix into the vagina, or it may be concealed, the blood accumulating in the retro-peritoneal space and infiltrating the muscle fibres, thus causing uterine atony, or it may rupture into the amniotic sac. The hæmorrhages which are small at first coalesce and extend to the tubes, ovaries, and out into the broad ligaments. Bloody fluid may be found in the peritoneal cavity probably coming from small fissures in the surface of the uterus. In a typical case the onset is sudden and violent, the severity of the symptoms depending on the degree of the separation. The patient who is in the last three weeks of pregnancy complains of a sudden abdominal pain of a colicky nature and soon shows signs of acute anæmia, followed by shock. A bloody vaginal discharge may or may not appear. On examination the uterus is found to be larger than usual, very tender, and of a peculiar wooden consistency. No placenta can be felt per vaginam. Treatment consists in emptying the uterus as soon as possible by forceps, version or Cæsarean section, stopping the hæmorrhage, and combating the anæmia. In some cases hysterectomy may be required. The prognosis is very grave, the maternal mortality being about 60 per cent. and the fœtal mortality about 90 per cent. Cases which survive require the utmost care and attention.

SURGERY OF THE THYROID GLAND.

IN the April number of the *British Journal of Surgery* Mr. James Berry gives an account of a series of 500 operations for goitre, with special reference to the after-results. The youngest patients were five girls of 14 years of age, who had parenchymatous goitres. Operations on children under puberty were only undertaken when urgent, for in the young there is danger of interfering with growth and normal development. The oldest patients were seven males between 70 and 75 years of age. The two commonest forms of goitre operated on were the non-encapsuled adenoparenchymatous, 137 cases, and the encapsuled cystic adenomatous, 109 cases. Seventy-nine operations were for true exophthalmic goitre as distinguished from "false" exophthalmic goitre. In the latter there is tachycardia, tremor, &c., without exophthalmos, mostly with unilateral goitre. Sometimes true exophthalmic goitre develops in a patient who has previously had an ordinary goitre for a more or less long period. Twelve cases of malignant disease were operated on, these being selected from a large number of cases of malignant disease which were seen. Of the cases operated on, two were sarcomata, one undetermined, and the others carcinomata of various types. The indications for operation were chiefly dyspnœa (274), discomfort and deformity (99), and exophthalmic goitre (79). Tracheotomy was never performed for innocent goitre, and is considered to be much more dangerous than thyroidectomy. But when dyspnœa is urgent a long tracheotomy tube, such as Koenig's, should be at hand. With bilateral goitre and severe dyspnœa it is often dangerous to rely on a unilateral operation. If only one lobe is removed, the other may bend the trachea to the opposite side and increase the dyspnœa. An important practical point is that often it is not the most obvious and prominent part of the goitre which is the cause of the dyspnœa. The real offending part is not unlikely to be the opposite lobe lying more deeply, perhaps wholly unsuspected, behind the sternum. An X ray examination is often useful in showing which part of the trachea, appearing as a band of light, is most deflected. In the young with bilateral goitres it is usually the least prominent lobe which causes the dyspnœa. The lower the situation of a goitre, the more liable it is to produce dyspnœa. Discussing the methods of operating, the writer remarks that he has never performed total removal of the gland and that he considers it unjustifiable and never necessary even for malignant disease. He rarely performs total removal of even one lobe. A portion of gland is nearly always left at the hilus, or "dangerous area," for various reasons, one being to safeguard the recurrent laryngeal nerve. Seven patients died from operation: two of them had simple goitre and succumbed some days later to pneumonia; three had exophthalmic goitre and died from cardiac failure; two had malignant goitre. Recurrent laryngeal nerve paralysis is known to have occurred three times. It is sometimes unavoidable in large, deep-seated tumours. The nerve lies in front of the groove between the trachea and œsophagus. It may be pulled forward with the gland when operating and is most likely to be injured at a level a little below that of the lower border of the pharynx.

An important table given is that showing the late results in 406 cases. The patients with simple goitre are nearly all well and in much better health than before operation. Of the 78 patients with exophthalmic goitre 53 are practically well, 18 much improved, 1 improved, 2 not improved, 1 worse, and 3 died. All were operated on before Dec. 31st, 1919, and 24 of them in 1913. Complete cure in this disease, with no trace of the previous symptoms remaining, is rare. Often a considerable amount of exophthalmos remains in patients who consider themselves otherwise well, and they may have palpitation on exertion. The operations are considered to be much more dangerous than most operations for simple goitre. The patients are often quite unsuitable for operation when brought to the surgeon. In some ligation of one or both superior thyroid arteries will give great relief. The condition of the myocardium is a very important factor in prognosis. Relapse may occur after a long period of good health. Of the 12 patients operated on for malignant goitres, 5 are living and well after periods of $1\frac{1}{4}$ to $7\frac{1}{2}$ years. One is fairly well but with recurrence $1\frac{1}{2}$ years after operation. Four have died from recurrence within a year, and 2 died from the operation. There has been no marked myxœdema in any of the author's cases. In a few, chiefly of extensive bilateral removals, there have been slight transient symptoms of thyroid insufficiency and the patients have benefited from taking thyroid extract. Tetany has never been seen by the author to follow operation for goitre, though he has operated 1338 times, and he is sceptical as to the separate function of the parathyroids.

We have closely followed Mr. Berry's own account of his experience, which adds a new and useful chapter to the literature on the practice and principles of this branch of surgery.

THE ROYAL SOCIETY EXHIBITS.

THE annual conversazione of the Royal Society was held at Burlington House, London, on May 11th, when Fellow demonstrated to Fellow such portions of new and original work as lent themselves readily to isolated treatment, the interest centring round the light thrown upon natural law rather than upon its application to human need. Medicine as the most highly specialised of sciences was consequently little represented. Mr. J. E. Barnard showed how certain animal tissues reveal marked differentiation of structure when illuminated by means of ultra-violet light. The image obtained is a fluorescent one and the resulting colours or tints depend on differences of chemical constitution. Apart from the biological interest of the method the image so formed is of considerable value for testing the optical qualities of microscopic objectives as the object so illuminated is a perfectly self-luminous one. Dr. Leonard Hill exhibited a recording kata-thermometer. This instrument gives a continuous record of the cooling power of the environment exerted on the surface of the bulb of the kata-thermometer, which is automatically kept at skin temperature. Introduced into the bulb of the "kata," which is filled with alcohol, is a coil of wire with a large temperature coefficient of resistance. This coil forms one arm of a Wheatstone bridge, which is balanced when the coil is at a temperature of 36·5° C. An automatic device is used by which the current sent through the coil varies according to atmospheric conditions, so that the coil is kept at 36·5° C. The ammeter placed

in series with the coil indicates the variations of current and so the cooling power. Mr. L. T. Hogben, from the Zoological Laboratory of the Imperial College of Science, illustrated the effect of pineal gland administration on the pigment cells of tadpoles. Within half an hour the melanophores retract to such an extent as to turn the brown opaque tad into a grey translucent one. No other organic extract has been found to produce this result. Of more practical importance was a demonstration by Mr. Franklin Kidd on the application of cold-storage and gas-storage to English apples. The Food Investigation Board recognises that improved methods of apple storage are required in order to bring the home grown apple into successful competition with imported apples throughout the winter season. In cold-storage the apples are kept just above freezing point. The method is costly. In gas-storage the apples are held in a gas mixture, created and maintained by their own respiratory activity, no machinery being required. The optimum CO_2 pressure has been determined and by its means the life of the apple is prolonged at a lower level of metabolism to twice its normal span. The specimens shown fully bore out this contention.

INTERNATIONAL TEAM-WORK.

COÖPERATIVE effort in medical research has of recent years been productive of so much good and its value is now so widely recognised that no one can doubt that team-work will continue to contribute to the advance of medical science. Yet when all due respect has been paid to the advantages of such coöperation one is forced to admit its limitations. Brilliant as are the results published from that most admirably equipped of all local teams captained by the Mayo brothers in America, it is doubtful whether anything they have produced can rank in practical importance beside the discoveries of such individuals as Koch, Pasteur, or Noguchi. The truth is that local team-work must be compared, not always to its advantage, with individual exploits. For this reason it is well to remember that for many years there have been widely scattered international teams working together with magnificent harmony in the various fields of physical disease. This would not have been possible but for the fine medical tradition that has always prevailed among physicians of every race and creed. It would be inaccurate to speak of the captain of an international team. The inspiration of genius is its sole directing force. But such a team is handicapped unless it possesses at least one member endowed with such critical insight and deductive imagination that he is able to sift the work of his colleagues and rearrange their variously coloured contributions into a comprehensive and cohesive pattern—in short, the value of a captain is as obvious in an international as in a local team. A brilliant example of this will be found in a recent paper on the course of the tubercle bacillus from sputum to the child by Dr. Allen K. Krause, of Baltimore.[1] Dr. Krause first restates the three main theories of the ætiology of pulmonary tuberculosis which may shortly be described as "the dust," the "droplet," and "the ingestion" theories. He argues that from the absence of direct evidence to confirm any one of these theories it is necessary to seek for correlative evidence. Here another group of observers, statisticians rather than pathologists, furnish their contribution. A composite infection chart is built from the charts of Moro (Munich), Mantoux (Paris), Petruschky (Danzig), Gaughofner (Prague), Pirquet and Hamburger (Vienna), Nottiman (Düsseldorf), Veeder (St. Louis), and Armstrong (Framingham). The evidence so collected shows that 10 per cent. of children are infected by the end of their second year of life, by 3 years 15 to 20 per cent., by 6 years 50 to 60 per cent., by 15 about 75 per cent.—i.e., only about one-seventh of all infected receive their first infection during the first two years. If the "droplet" method of infection accounts for all infections, then children must be confined indoors more between the ages of 4 and 7 than between birth and the age of 3. The argument is that infection is most rife at the age when children play amongst the dust both of the house and of the street. The hands of the normal child "are dirty most of the time" and "few children have developed a consciousness about putting their hands in their mouths." Here is a practical moral drawn from the work of two generations of the members of the tuberculosis team scattered across the world. It is a moral that deserves attention.

[1] New York State Journal of Medicine, March, 1921, p. 83.

ACUTE NITROBENZOL POISONING.

ACCORDING to Dr. Robert F. Loeb, Dr. Arlie V. Bock and Dr. Reginald Fitz,[1] of the Medical Clinic of the Massachusetts General Hospital, Boston, who are engaged in a series of studies on the physiology and pathology of the blood, nitrobenzol or oil of mirbane, a coal-tar derivative resulting from the action of strong nitric acid on benzol, was first discovered by Mitscherlich in 1834, but it was not until 1859 that Caspar described it as a new poison with toxic properties. It is employed in the manufacture of high explosives, and is used to a limited extent in perfumery, soap, confectionery, cookery, in making dyes, and in pharmaceutical laboratories. Grandhomme, in 1883, collected 43 cases of nitrobenzol poisoning, the majority of which had occurred a comparatively short time after nitrobenzol had been used commercially. After the appearance of Grandhomme's work only a few new cases were published until two years ago, when Stifel reported 17 cases which were poisoned by nitrobenzol in shoe polish. Subsequently Scott and Hanzlik, Donovan, and Dr. Loeb and his colleagues met with cases in which intoxication was due to nitrobenzol being consumed as a substitute for alcohol. The toxic action of nitrobenzol, as shown by Filehne's experiments in 1878, is due to the fact that it renders the blood unable to transport oxygen. Experiments on dogs showed that hæmoglobin was changed into another form with a characteristic spectroscopic absorption line which did not correspond to any of the ordinary hæmoglobin products. Whether nitrobenzol hæmoglobin, meth-hæmoglobin, or both are produced is uncertain. The clinical picture consists in a gradual onset of nervous and digestive symptoms going on to coma and death, the skin assuming a characteristic blue-black colour. The urine is almost black and contains para-amido-phenol. In cases which recover, the changed hæmoglobin returns to normal hæmoglobin quickly, so that oxygen can again be carried to the body cells in a short time. Although the majority of the recent cases in America have been mild, nitrobenzol may often be a fatal poison, as is shown by the fact that the mortality among Grandhomme's cases was 32 per cent. There is no specific antidote, but treatment consists in as complete and rapid removal as possible from the body of any nitrobenzol which has not been absorbed. Bleeding and transfusion are indicated in the severest cases.

[1] The American Journal of the Medical Sciences, April, 1921.

THE "STABILITARY" REACTION OF THE BLOOD.

EVERY laboratory worker who has to collect from patients each week large numbers of blood specimens for fixation of complement tests is acquainted with those curious phenomena which occasionally occur during clotting. Sometimes a blood sample will clot almost as soon as it is withdrawn from the syringe, occasionally it will remain fluid for several hours, occasionally also it shows hæmolysis, and every now and then a specimen is found which produces an almost opalescent serum. Some of these phenomena are doubtless due to mechanical factors of manipulation; but apart from these it seems clear that we are presented with inexplicable stages in that colloidal reaction, coagulation of protein, which is probably due in a large measure to the reduction in the surface energy at the interface of the colloid, and is known biochemically as the adsorption phenomenon. These colloid changes

give rise to outward and visible signs such as agglutination and precipitation, altered rate of coagulation, increased or decreased viscosity, and the like; and every one of them has been made the basis of a clinical laboratory test. In the current number of the *British Journal of Tuberculosis* Dr. A. Westergren, of Stockholm, describes briefly the "stabilitary" reaction of blood which depends on the rate of sedimentation of red blood corpuscles in a column of withdrawn citrated blood. Briefly, the test is as follows. The blood is withdrawn from the patient's vein by means of a syringe having one-fifth of the barrel filled with 3·8 per cent. sodium citrate solution. When the remaining four-fifths have been filled with patient's blood the contents are immediately emptied into a small test-tube and well mixed. The mixed blood is then drawn into a pipette-tube 30 cm. long (with an inner diameter of 2·5 mm.) up to a height of 20 cm. and placed in a rack. The time is noted, and the tube allowed to stand for 1, 2, and 24 hours, when the test is read off by measuring the height of the layer of plasma in millimetres from the lower meniscus of the free surface to the upper border of the deposited blood corpuscles. In blood drawn from healthy men the top layer of clear plasma at the end of one hour is said to be 2 mm. and in women 5–10 mm. An increased sedimentation (i.e., a reduced suspension stability of the blood) is found in pregnancy and in acute infectious diseases, especially when associated with much pyrexia. Dr. Westergren finds that this increased sedimentation is markedly shown in cases of acute pulmonary tuberculosis. He says: "No single test of an active or probably active case has given a normal value, and no case which must be considered quite benign, and certainly shows no signs of activity, has given a high, even a middle-high, figure." He therefore considers the reaction to be a more reliable measure of activity than is a temperature record. The reaction is, of course, in no way specific, and can only have a relative value in estimating activity as an aid to diagnosis and prognosis. A full account of this reaction is given in English in *Acta. Med. Scandinavia*, Vol. LIV., pp. 247–281.

SO-CALLED SNOW-BLINDNESS.

SOME interesting notes regarding the pathological effects of the visible and invisible spectrum on the eye, more especially in relation to snow-blindness, are contributed by Mr. Arthur W. Ormond in the April number of Guy's Hospital Reports. These make it plain that both visible and invisible rays can produce definite pathological effects on the ocular tissues, but further inquiry is required to prove the exact wave-lengths which set up these changes. The heavy incidence of cataract in glass-workers—exposed as they are to the intense heat and brilliant illumination of molten glass—led to the suggestion that the heat rays are the cause of the injury in these cases, and the balance of opinion appears to be in favour of this hypothesis. However, more recent experiments suggest that lenticular changes may be produced by ultra-violet radiations. The effects of sunburn are probably due not to visible but to ultra-violet rays. Meantime, we have some interesting first-hand observations by a young officer, a member of a Canadian Arctic expedition, who visited Parry Archipelago and its neighbourhood. To begin with, it is suggested that snow-blindness is "a bad term, as the victim is not blind." The condition was never experienced in extremely low temperatures and seldom at freezing point, but generally in a condition of mist or fog, a fog-haze or "white-darkness" in snow-covered regions when all sense of perspective and stereoscopic vision is lost. Bright sunlight affected the eyes in a different manner, and real blindness was never the result of bright glaring sunlight and shadow. The symptoms of severe conjunctivitis and superficial ulceration of the cornea were pronounced, "grittiness," discharge from eyes and nose, in 24 hours intense local pain—lasting sometimes for 10 or 12 hours—the pain being described as the sensation of thousands of red-hot needles being forced through the eyes to the sockets. The eyeballs and lining of the lids are covered by a greyish film, through which the iris and pupils are just discernible. The sufferer can see nothing, even with the eyes held open. If the eyes are protected by bandages at the first noticeable symptoms, after three days the eyes are practically normal, but there is a tendency to relapse if unfavourable conditions recur. The use of dark or coloured glasses is sufficient protection, but the leader of a party cannot always keep glasses before his eyes: the glasses become dimmed with hoar-frost and have to be removed to be cleaned. The native Eskimos are not immune from attacks of snow-blindness, and Scott and Shackleton observed that dogs and ponies manifested characteristic symptoms. The Eskimo has learned to recognise weather conditions which are dangerous from this point of view and arranges his travels accordingly. When he does travel—rarely more than five miles a day—he protects his eyes with horizontally slotted wooden spectacles cut from soft drift timber; even these are not absolutely preventive. Nansen records that in his Polar expedition only two of his party, who had neglected the necessary precautions, suffered from snow-blindness.

As to the part of the spectrum responsible for the sensations experienced by the victim, we may exclude the infra-red rays; nor is the visible spectrum entirely responsible, for in the tropics, where light is very intense, symptoms such as these are not experienced, and in summer there is no complaint of "snow-blindness" amongst ordinary Swiss tourists. Fuchs, of Vienna, records that some visitors to the Alps after exposure to the snowfields "see red," especially in a dimly illuminated room. The question remains whether snow-blindness can be due to ultra-violet rays alone. During the war an acute condition of the eyes similar to snow-blindness was set up in persons working with a searchlight device elaborated for signalling at sea, whereby all parts of the spectrum except the ultra-violet and a few red rays were filtered out. The effects seem to be due not so much to the quality as to the quantity of these rays. A few of the short rays may penetrate to the lens, but experiment shows that very few ultra-violet rays reach as far as the retina. Retinal symptoms are not amongst those caused by snow-blindness. The glass made by Sir William Crookes for "goggles" to prevent blindness, which transmits the greatest amount of light and the smallest proportion of ultra-violet rays, effectively combats the source of irritation. But the luminous rays of the spectrum under certain conditions may also produce pathological effects; in the slighter cases there is recovery, but in some cases the scotoma is permanent. Some thoughtless people found this out to their cost during the recent partial eclipse of the sun.

SOME CONDITIONS AFFECTING THYROID ACTIVITY.

ACCORDING to W. B. Cannon and P. E. Smith, of the Harvard Medical School,[1] gentle massage of the thyroid of a cat for two or three minutes causes an increased rate of the denervated heart, amounting in some instances to 33 per cent. over the basal rate. The development of the maximal increase of rate is usually slow, requiring 30 to 60 minutes, and its diminution is also slow. This augmentation of heart-rate caused by thyroid massage occurs in the absence of the adrenal glands. Stimulation of the cervical sympathetic trunk as it leaves the ganglion stellatum induces a similar augmentation of the denervated heart, but this does not occur if the thyroid gland has been previously removed. If the cardiac fibres from the stellate ganglia are severed, as well as the vagus nerves and an afferent nerve, such as the sciatic or brachial, is stimulated under a degree of anæsthesia which will permit of reflex contraction of the nictitating membrane and dilatation of the pupils, there is a primary increase of rate due to adrenal secretion.

[1] Endocrinology, iv., 1920.

followed by the slowly developing increase characteristic of thyroid stimulation. If the vagi and the cardiac fibres of the stellate ganglia are cut, and the animal is asphyxiated under conditions which permit the eye changes already described, there is a similar primary rise due to adrenal secretion, followed by the secondary thyroid effect. If the thyroid glands have been previously removed, sensory stimulation and asphyxia induce only the increase of rate due to adrenal discharge.

Some interesting observations on hyperplasia and hypersecretion of the thyroid glands in children and adolescents are recorded by E. Schlesinger.[2] In goitrous regions the thyroid is larger in new-born children than in non-goitrous districts. This hypertrophy, however, disappears in a few months, and the follicles of such children later on are smaller in diameter (100–150 μ) than normal (200–250 μ). In boys there begins at about the ninth and in girls at the sixth–seventh year a new enlargement of the thyroid gland, which diminishes just before puberty. The hyperplasia which occurs in about one-third of the girls and in one-sixth of the boys from 10–17 years of age is accompanied by tachycardia, which in the majority of the cases is not neuropathic in origin, but is a sign of hyperthyroidism. Exophthalmos and thyroid heart were only occasionally observed. An interesting feature was the mental activity and quick comprehension in these cases of thyroid hyperplasia. Growth was accelerated, and in girls the sexual development more pronounced than in the other girls of the same age. Sometimes curvature of the spine and marked myopia were observed. The use of thyreoidin proved very useful and caused the cardio-vascular symptoms to disappear.

THE Croonian Lectures to the Royal College of Physicians of London will be delivered by Dr. F. L. Golla on June 9th, 14th, 16th, and 21st, at 5 P.M. The subject will be the Objective Study of Neurosis.

[2] Zeitschrift f. Kinderheilk., vol. xxvii., 1920.

URBAN VITAL STATISTICS.

(Week ended May 7th, 1921.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate population estimated at 18½ million persons, the annual rate of mortality, which had been 12·5 in each of the four preceding weeks, fell to 12·4 per 1000. In London, with a population of 4½ million persons, the annual rate was 11·5, or 0·6 per 1000 below that recorded in the previous week, while among the remaining towns the rates ranged from 6·0 in Enfield, 6·8 in Ealing, and 6·9 in Gillingham, to 19·2 in Halifax, 19·3 in Liverpool, and 19·8 in Stockton-on-Tees. The principal epidemic diseases caused 238 deaths, which corresponded to an annual rate of 0·7 per 1000, and comprised 76 from whooping-cough, 57 from infantile diarrhœa, 55 from diphtheria, 31 from measles, 16 from scarlet fever, and 3 from enteric fever. Whooping-cough caused a mortality of 1·6 in Derby and diphtheria of 2·4 in Acton. There were 3195 cases of scarlet fever, 2343 of diphtheria, and 1 of small-pox under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, against 3255, 2453, and 1 respectively at the end of the previous week. During the week ended April 30th 4 cases of encephalitis lethargica were notified in the County of London, from Bethnal Green, Camberwell, St. Marylebone, and Woolwich respectively. The causes of 31 of the 4427 deaths in the 96 towns were uncertified, of which 10 were registered in Birmingham.

Scottish Towns.—In the 16 largest Scottish towns, with an aggregate population estimated at nearly 2½ million persons, the annual rate of mortality, which had been 14·6, 14·6, and 15·0 in the three preceding weeks, fell to 14·7 per 1000. The 343 deaths in Glasgow corresponded to an annual rate of 16·3 per 1000, and included 29 from whooping-cough, 6 from infantile diarrhœa, 3 from diphtheria, and 1 from measles. The 124 deaths in Edinburgh were equal to a rate of 14·5 per 1000, and included 5 from whooping-cough and 4 each from measles and diphtheria.

Irish Towns.—The 152 deaths in Dublin corresponded to an annual rate of 18·7, or 1·3 per 1000 above that recorded in the previous week, and included 3 from diphtheria, 2 from infantile diarrhœa, and 1 from whooping-cough. The 125 deaths in Belfast were equal to a rate of 15·5 per 1000, and included 9 from whooping-cough, 3 from infantile diarrhœa, and 2 from scarlet fever.

TUBERCULOSIS.

Results of Proper Sanatorium Treatment.

THE twenty-fourth annual report of the Loomis Sanatorium, New York, must be rather disconcerting to the arm-chair pessimist. This 95-page report is so full of information that it is possible not only to learn the results achieved, but also—and this is far more important—to learn something of the ways and means yielding these results. The Loomis Sanatorium has a capacity for 183 patients "presenting a fair prospect of recovery." In practice this standard means that about 10 per cent. of the cases are incipient, 50 per cent. are moderately advanced, and 40 per cent. are far advanced on admission. To judge by the list of occupations of the patients, they belonged for the most part to the class for which King Edward VII. Sanatorium, Midhurst, caters. After nearly a quarter of a century's work, inquiries were addressed to 1582 former patients. In 1350 cases information as to the fate of these patients was obtained. In 91 per cent. of these replies it was stated that the patient was still alive, and of the 1225 survivors 85 per cent. were "leading normal lives, and, in most instances, pursuing their vocations."

So much for the results. How were they obtained, and why are they so much better than the results obtained elsewhere? The average duration of treatment was from 30 to 45 weeks. How many public sanatoriums in this country keep their patients so long? A resident, fully qualified dentist was employed, and during the past year radiographic dental studies were part of the routine examination of every new patient. "It seems unquestionable that even unrecognised dental disease exerts an unfavourable influence upon the recovery of tuberculous patients." How many public sanatoriums in this country provide their patients with adequate dental treatment? The resident medical staff of the Loomis Sanatorium consists of five. How does this ratio of five doctors to 183 patients compare with the staffing of public sanatoriums in this country? Constantly increasing use has been made of the X rays, not only in diagnosis, but also in controlling treatment. Of serial stereograms the report says: "Such studies will often enable the clinician immediately to make a readjustment of the patient's regime which checks further retrogression, but which, if delayed until the development of more significant symptoms, may not be availing." A few months ago in this country a medical superintendent, in charge of a sanatorium with more than 100 beds, and carrying out treatment by artificial pneumothorax, was refused an application for an X ray apparatus. Not only is the treatment varied greatly at the Loomis Sanatorium, but there is a widely ramified system of research in the laboratory and at the bedside. In how many public sanatoriums in this country are facilities provided for research or even for checking the researches of others? In 17 per cent. of the cases resident in the sanatorium when the report was issued treatment by artificial pneumothorax was being practised. How many sanatoriums in this country still refuse to give any of their patients the benefit of this treatment? With regard to occupational therapy, the report expresses no doubt as to its benefits to the mind, but it does not attempt to decide how far it is beneficial to the body. The occupational therapy practised at Loomis appears to consist of light, skilled work, such as basketry and typewriting, and the exercise prescribed is graduated walking. Conspicuous by its absence is the unskilled heavy labour of trenching and tree-felling meted out to consumptives in some English sanatoriums. Many other distinctive features of sanatorium treatment, as practised at Loomis, might be noted, but the résumé just given should suffice to show that a high percentage of permanent sanatorium cures is not the result of fortuitous circumstances, but of prolonged and skilled treatment.

King Edward VII. Sanatorium: Fourteenth Annual Report.

This report, which covers the period July, 1919–July, 1920, shows that a considerable amount of

research work is being carried out in addition to the ordinary routine of treatment. This is all to the good, and it is almost a truism that patients and physicians alike prosper most in institutions in which research follows hand in hand with routine work. Studies have been undertaken into the relation of Pfeiffer's bacillus to tuberculosis, and among 85 cases investigated 8 were found harbouring this bacillus. But only in one case was there evidence to suggest that it might play an important part in the genesis of the patient's symptoms. Other research concerned the acid-fastness of tubercle bacilli and complement-fixation. A large proportion of the staff was given prophylactic vaccine treatment against influenza, and since this vaccination there have been no further indications of influenzal infection among them. The treatment adopted was that of graduated labour, punctuated by adequate rest. In April, 1920, an up-to-date and thoroughly efficient X ray department was opened, and this has proved useful for artificial pneumothorax treatment, which has now been taken up in this institution. A case is referred to in which the physical signs were confined to one side of the chest, but in which an artificial pneumothorax was not induced because the X rays showed both lungs to be involved.

Light on Mixed Infection in Pulmonary Tuberculosis.

Two recent papers illuminate the problem of mixed infection in pulmonary tuberculosis from a hitherto comparatively obscure quarter. Dr. Arthur L. Bloomfield[1] has studied the mechanism of the bacillus carrier state, with special reference to the Friedländer bacillus. He believes that the survival of important pathogenic organisms in the body may depend on the existence of a focus of diseased tissue in the upper air passages, where these organisms multiply and whence they are discharged to other parts of the body. He attempted to produce artificially a carrier state by frequent reinoculations of a person whose tongue was swabbed with a freshly isolated strain of *B. Friedländer*. Cultures were taken at various intervals for a week, but it was found that within 24 hours of the last inoculation *B. Friedländer* could no longer be found. Of 85 unselected persons, 5·8 per cent. proved to be carriers of *B. Friedländer*, and this carrier state persisted throughout the period of observation. But there was no tendency for contacts to acquire the carrier state, and differential cultures showed the breeding-place of the *B. Friedländer* to be in the tonsil. The carrier's own strain or a foreign strain of *B. Friedländer* implanted upon the free surfaces of the mucous membranes disappeared as quickly as in a non-carrier.

The second paper is by E. Schulz,[2] who records, at considerable length, the case of an officer, aged 40, who had suffered from pulmonary tuberculosis since 1908. The most instructive features of his chequered career were these: his sputum contained numerous staphylococci and influenza bacilli as well as tubercle bacilli. The tonsils were not enlarged and gave rise to no symptoms, but their bacteriological examination revealed numerous staphylococci as well as diplococci, Friedländer's pneumococci, and a few granular rods. He was subject to acute exacerbations of fever, which were not permanently controlled by antiseptic treatment of the tonsils. The last bacteriological examination of the tonsils showing an almost pure culture of staphylococci and diplococci pneumococci being conspicuous by their absence, tonsillectomy was performed. Soon afterwards examination of the sputum revealed total absence of cocci, tubercle bacilli alone being found in great quantities. The operation was followed by the disappearance of clinical signs of mixed infection, the temperature being normal, and the sputum sterile except for tubercle bacilli.

In 1913 Brauer drew attention to the relation of "exercise fever" in pulmonary tuberculosis to slight chronic inflammatory changes in the upper respiratory passages, and he focussed attention on the tonsils. More recently John[3] has pointed out that in some cases suspected of pulmonary tuberculosis treatment of the tonsils restores the patient to complete health. Still more recently Kraus[4] has discussed the relation of apical catarrh of the lungs to chronic tonsillitis.

The Framingham Tuberculosis Demonstration.

It may be remembered from earlier accounts[5] that Framingham, Massachusetts, a representative community of approximately 16,000 souls, was chosen as the subject for a gigantic experiment in hygiene, with tuberculosis as the central problem. This demonstration began early in 1917, and was financed by a special gift from the Metropolitan Life Insurance Company to the National Tuberculosis Association. In a recent report Dr. D. B. Armstrong[6] has given a bird's-eye view of the results already achieved. They are, indeed, imposing. His review may be discussed under the following headings:—

Incidence.—Approximately 1 per cent. of the population was found to suffer from active tuberculosis, and another 1 per cent. from inactive tuberculosis. When the search for tuberculosis was started there were only 27 known cases of tuberculosis under care, and there had never been more than 40 known cases at one time, the ratio of known cases to annual deaths being about three to one. An intensive search soon revealed several hundred cases, and the ratio of known active cases to annual deaths was found to be nine or ten to one. As Dr. Armstrong very pertinently remarks, this first step—i.e., discovery of the disease—is essential, for it is of relatively little use to provide adequate machinery for the care of one-third of the active cases in a community if the other two-thirds are undetected.

Machinery for detection of tuberculosis.—Before the demonstration was instituted the detection of tuberculosis largely depended on nurses and other non-medical persons. The examination by medical men disclosed approximately nine times as much tuberculosis as was found by the nurses in their search for the disease. Consequently, though no reflection is cast on the utility of the nurse in the anti-tuberculosis campaign, it is now admitted that the full quota of tuberculosis cannot be found without proper medical examination. The routine medical examination of three-fourths of the population of Framingham yielded many discoveries of tuberculosis.

Percentage of cases to be diagnosed at an early stage.—Before the demonstration only 45 per cent. of all the cases were detected at an early stage. Since the beginning of the demonstration this ratio has been raised to 83 per cent. The calculation is made that the remaining 17 per cent., found to be advanced when first detected, could be further reduced by 3 per cent., but that at least 14 per cent. of all cases will escape early detection however effective the machinery for early diagnosis may be.

The proportion of inevitable deaths.—To the question, How many patients will die in spite of adequate treatment? the answer is given that, in spite of all measures, the irreducible mortality is probably about 16 per cent. This estimate is based on the fact that 21 per cent. of the 356 early and late cases under observation during the four years of the demonstration had terminated fatally. A careful study of these cases suggested that, with proper machinery, 5 per cent. could have been saved, and by the subtraction of this 5 per cent. the irreducible minimum of the 16 per cent. mortality is obtained.

Number of beds necessary for the treatment of tuberculosis.—At least one bed should be provided for every annual death.

Cost of a tuberculosis campaign.—Dr. Armstrong finds that it is impossible to separate the cost of tuberculosis work from that of general health work, as the two are closely interwoven. At the beginning of the demonstration Framingham was spending approximately 40 cents per year per head on all kinds of health work. It is now spending about $2 per year per head from public and private funds. He proceeds: "This amount of money will buy reasonably adequate pre-natal, infant, and pre-school work; satisfactory school health work; industrial health work; special tuberculosis work along many lines; and general community sanitation."

Results.—Tuberculosis as a cause of illness in Framingham is apparently being brought under control. The mortality per 100,000 for the decade preceding the demonstration was 121·5. The corresponding ratio for the period of the demonstration

[1] American Review of Tuberculosis, January, 1921.
[2] Beiträge zur Klinik der Tuberkulose, March 15th, 1921.
[3] Münch Med. Woch., 1916, Nr. 34.
[4] Therap. d. Gegenw., 1920, Nr. 1.
[5] THE LANCET, 1921, i., 344.
[6] The American Review of Tuberculosis, February, 1921

was 84·2—i.e., a reduction of about one-third. For 1920 the corresponding ratio was 64·5 per 100,000—i.e., a reduction of about one-half of the pre-demonstration rate. Should the U.S.A. as a whole follow Framingham's lead, it is estimated that 75,000 lives could be saved annually.

Norfolk Tuberculosis Farm Colony.

The inauguration of this colony was due to the initiative of the Norfolk Branch of the British Red Cross Society, who in 1919 offered to contribute the sum of £25,000 towards the establishment and equipment of a farm colony for patients in whom tuberculosis had been arrested by sanatorium treatment. The offer was conditional on the maintenance and further development of the project being undertaken by the Norfolk County Council, the Norwich City Council, and the Yarmouth Borough Council, who accepted the offer and obtained from the Ministry of Health the appointment of a Statutory Joint Committee to manage the undertaking. A property of over 700 acres was purchased, with good farm buildings, at Stanninghall, five miles from Norwich. The site of the colony is in a very open situation, on high ground, close to the picturesque ruins of an ancient abbey. Existing farm buildings have been utilised as an administrative block, containing committee-rooms and offices and apartments for a resident superintendent, matron, and nurse. There are also good kitchens and a dining-room for the patients. The colony was opened in April, 1920. There are at present 30 inmates, all men. The first patients were housed in a small number of shelters, but a large army hut was purchased later and divided into cubicles for 20 men. These cubicles are open to the south, and each accommodates two patients; they can be closed by curtains when the weather conditions do not admit of their being left open. Another large hut is now being adapted for the reception of 20 more patients. There is a well-equipped carpenter's shop on the premises, built by the inmates, and the men are being trained in carpentering, also in poultry and pig-keeping, making their own fowl-houses and pig-styes, as well as in market gardening, fruit farming, and forestry, under the supervision of experts who give their services voluntarily. A bowling-green is now being laid down, and a large hut has been fitted up as a recreation-room open after 6 P.M. for billiards and other amusements. The colony is under the medical supervision of Dr. W. B. Christopherson, tuberculosis officer for Norfolk, Dr. F. W. Burton-Fanning acting as medical adviser. Mr. H. R. Orr, formerly games master at Elston school, is resident superintendent, and the matron is Miss Bobby, for many years at Kelling Sanatorium. In regard to admissions, preference is given to ex-Service men, who are examined prior to admission in order to exclude acute cases. Beds are allotted in the proportion of three-eighths for Norfolk, three-eighths for Norwich, and two-eighths for Yarmouth. Up to the present the Insurance Committees pay £2 11*s.* for each inmate, but financial support now passes into the hands of the county council. The farm is being carried on as a separate undertaking under the management of Mr. Charles Gowing. The Red Cross Society spent over £9000 on stocking the farm, and it is hoped that as the colony grows the inmates will be able to take over from the farm such land as they can work. In the meantime the farm pays rent to the Joint Committee. The immediate need of the colony is the provision of cottages where married men can have their wives and families to live with them.

DONATIONS AND BEQUESTS.—By the will of the late Mr. Henry John Milbourne the testator left £5000 to Dr. Barnardo's Homes, and £200 each to Middlesex Hospital, King's College Hospital, Guy's Hospital, University College Hospital, East London Hospital for Children, Surgical Aid Society, Great Northern Hospital, and St. Mary's Hospital.—Subject to his wife's life interest, the late Mr. E. A. Eades, of Birmingham, has left, among other bequests, £1250 each to the Women's Hospital, Birmingham, and the Children's Hospital, Birmingham.

MEDICINE AND THE LAW.

What Constitutes "Breach of Agreement" by a Panel Doctor.

REPORTS of Inquiries and Appeals under the National Health Insurance (Medical Benefit) Regulations (England), 1913, which are published from time to time, contains a large amount of information which is of considerable interest to the panel doctor. The first volume, which was published in August, 1917 (Cd. 8549), includes notes of inquiries held upon medical practitioners and persons supplying drugs, reports of appeals against deductions on the ground of excessive prescribing, and of cases relating to questions of "competence and skill." A second volume, published in January, 1919 (Cd. 18), contains reported decisions down to June, 1918. All these reports are anonymous in the sense that the name of the practitioner whose conduct is called in question is not published. Under Section 15 (2) (*b*) of the National Insurance Act, 1911, any duly qualified medical practitioner who is desirous of being included in the medical list of an Insurance Committee is entitled to be so included, but, "where the Insurance Commissioners, after such inquiry as may be prescribed, are satisfied that his continuance in the list would be prejudicial to the efficiency of the medical service of the insured they may remove his name from the list."

The form of the inquiry is prescribed in Part VI. of the National Health Insurance (Medical Benefit) Regulations (England), 1913. These Regulations provide that if any representation is made by an Insurance, Local Medical, or Panel Committee to the effect that the continuance of a practitioner upon the panel is prejudicial to the efficiency of the medical service of the insured, the Commissioners shall thereupon institute an inquiry. If similar representations are made by any other person or body the Commissioners have a discretionary power to institute an inquiry, and they have a further power to do so, in cases where they think fit, in the absence of any representation. For the purpose of each inquiry the Commissioners constitute an Inquiry Committee consisting of three persons, one of whom must be a barrister-at-law or a solicitor in actual practice and the other two medical practitioners. It is the duty of the Inquiry Committee to draw up a report stating such relevant facts as appear to them to be established by evidence and the inferences which may properly be drawn. After consideration of this report the Commissioners take such action, if any, as they think fit. It should be mentioned that it was decided in one case (September, 1917, vol. ii., p. 21) that evidence on affidavit will not be received. A witness must attend and submit to cross-examination. Parties may be represented by solicitor or counsel. By the National Health Insurance Act, 1918, the provisions of the Arbitration Act, 1889, have been applied to these inquiries. The effect of this is that witnesses may be compelled to attend, and costs may be awarded to the unsuccessful party.

It will be useful to deal with some of the cases in which practitioners have appealed to the Commissioners on questions relating to alleged negligence or breach of agreement. Article 45 (16) of the National Health Insurance (Medical Benefit) Regulations (England), 1913, requires an Insurance Committee to inform a medical practitioner of the decision arrived at on any case dealt with by the Medical Service Subcommittee to which he has been a party, and entitles the practitioner to appeal from the decision to the Insurance Commissioners within 14 days after receiving such notice. Article 51 of the same Regulations deals with the procedure on appeal, and empowers the Commissioners either to decide the case without a hearing or, if they think that a hearing is required, to authorise any two or more of their number to hear and determine the appeal. It is important to notice that the Insurance Committee is bound by the agreement with the practitioner, and has no power to go outside it. Thus an Insurance Committee's power to withhold money from

a doctor on the panel must be exercised strictly in accordance with the terms of the agreement and regulations conferring the power, which require that the case shall first be investigated by the Medical Service Subcommittee or Joint Services Subcommittee. So a decision to withhold money from a doctor, at which the Committee purported to arrive after the matter had been considered by the Medical Benefit Subcommittee only and without notice being given to the doctor, was held to be invalid.

Again, a charge must be strictly proved by proper evidence. For example, where there was a complaint made by an insured person against a practitioner on the ground that he had failed to attend her, the question turned on the nature of a verbal message alleged to have been sent to the practitioner and of his reply to the messenger. Neither the complainant nor the messenger attended before the Medical Service Subcommittee, nor was any written statement by the messenger put in evidence. It was held that there was not sufficient evidence before the Committee to support the complainant's case.

If a panel doctor appoints a deputy the effect of Clause 8 of the common form of agreement is that the practitioner is responsible in all respects for the acts and omissions of the deputy. The Commissioners have thus interpreted the clause:—

"This clause does more than impose an obligation on the practitioner to supply a competent deputy. It requires the practitioner, when he is prevented from giving attendance personally, to provide that another practitioner will attend his patients as his deputy on his behalf; and we cannot doubt that in these circumstances the deputy attends the patient as the agent of the other practitioner, who is responsible in all respects for the acts and omissions of the deputy."

In the case, however, of any complaints being made against a practitioner acting as deputy for a practitioner on the panel, the Commissioners have said that notice of the charge and hearing should be sent to both practitioners concerned.

The panel doctor is under a statutory duty to the panel patient. It has been held that a practitioner on the panel and an insured person on his list cannot, by mutual arrangement and without reference to the Insurance Committee, release the former from the obligation to treat the latter imposed by Clause 2 (ii.) of the agreement. Unless and until the insured person is transferred from the doctor's list in accordance with one of the methods provided by the medical benefit regulations the doctor's obligations remain unchanged, and the acceptance of a fee in respect of services within the scope of the agreement involves a breach of the agreement. In the course of a decision the Commissioners made the following observations of a general nature:—

"It is obvious that it is within the power of a doctor on the panel to adopt an attitude towards his panel patients which will inspire them with misgivings as to the efficacy of the treatment and drugs provided under the panel system. Apart from open disparagement of the system, a feeling of distrust may be created in the minds of his patients, and in particular those who, for whatever reasons, are predisposed to view with suspicion the arrangements made for medical benefit. If it comes to the notice of an Insurance Committee that in more than one instance the patients of a panel doctor have expressed their intention of foregoing their right to medical benefit and of obtaining treatment from the *same* doctor as private patients, the conduct of the doctor is clearly liable to misconstruction."

The Commissioners pointed out that there was nothing in the case before them to lead them to suppose that the practitioner whose conduct was under notice had erred in this respect.

A marked distinction is drawn by the Commissioners between mere error of judgment and negligence. In one case the appellant, who had treated a patient for neurosis, chronic rheumatism, and biliousness from September, 1913, to Jan. 31st, 1914, visited the patient in response to a message from the latter's wife on Feb. 1st, 1914, and examined him without taking his temperature. In the afternoon the patient called in another practitioner who diagnosed rheumatic fever. The Insurance Committee found that the allegation of neglect on the part of the appellant had been substantiated. It was held that, while the failure of the appellant to take the patient's temperature might have been an error of judgment, it did not constitute a breach of his agreement. In another case the Medical Service Subcommittee held that a charge of one guinea for attending a consultation was not justified. The practitioner appealed. It appeared that the appellant while attending a patient for typhoid fever was asked by the patient's mother, who was acting as his nurse, to meet another practitioner in consultation. The appellant consented to do so, but charged a fee on the ground that the consultation was unnecessary and that in attending it he was acting on behalf of the patient's mother. On a complaint by the insured person, the Insurance Committee decided that the charge was a breach of the appellant's agreement. It was held that as the appellant had in fact attended the consultation his action was for the general benefit of the patient, and in view of the mother's anxiety the consultation was not unnecessary. In giving their decision the Commissioners pointed out that it was open to the practitioner to refuse to attend the consultation if he believed that no benefit to his patient would result therefrom, directly or indirectly.

The procedure to be adopted by a practitioner who declines to accept a particular patient is laid down in the regulations. Arrangements made under Article 21 (4) of the Medical Benefit Regulations, 1913, required an insurance practitioner, who refused to accept an insured person for treatment, to give him a form containing instructions as to the steps to be taken to obtain treatment. In one case appellant, to whom an insured person applied for treatment, having refused treatment under the medical benefit arrangements and omitted to give the patient the form referred to, accepted the insured person as a private patient and subsequently charged him £5. It was held that the practitioner had committed a breach of his agreement with the Insurance Committee. It was also decided in this case that the fact that the doctor might, if he had put in motion the proper procedure, have had it established that some of the services rendered by him to the patient were of a specialist character, and therefore outside the scope of his agreement, did not justify his action.

In issuing certificates of "incapacity" the practitioner cannot divest himself of his responsibility by calling in a medical referee. In one case an insurance practitioner, being doubtful as to the continued incapacity for work of an insured person attended by him, suggested to the patient's Approved Society that an examination by a medical referee was advisable. The referee having stated that in his opinion incapacity still existed, the practitioner continued, notwithstanding his personal opinion to the contrary, to issue certificates of incapacity, some of which were given without examining the patient. It was held that the practitioner could not evade his personal responsibility for the issue of medical certificates by pleading that he acted on the opinion of a medical referee. His proper course was to have refused to issue certificates.

In one case the appellant, while attending an insured person on his list who was seriously ill, stated in the presence of her mother and herself that she required a drug which was very expensive and which he could not order owing to her being on the panel. In consequence of this statement the patient's mother engaged another doctor and paid for his services. It was held that the doctor's action was not consistent with the professional obligations which he had undertaken by the terms of his agreement with the Insurance Committee, and that the expense of employing another doctor was reasonably incurred in consequence of the appellant's breach of the agreement. The referee in giving his opinion said:—

"The appellant on the occasion in question made use, without justification, of language which gave his patient and her mother reasonable ground for believing that the patient could not receive adequate treatment as an insured person, and that such action is not consistent with the professional obligations which the doctor by the terms of his agreement had undertaken to discharge."

The doctor should not make any attempt to disparage the panel system or panel treatment.

Arsenic in Borax.

A summons under the Sale of Food and Drugs Act was heard at Salford on April 27th against a pharmacist for selling borax not of the nature or substance demanded. Borax sold to a health inspector contained arsenic equal to 3 gr. per pound of borax, instead of 1·28 gr., as required by the British Pharmacopœia. The defence relied on a warranty obtained from the supplying firm. The pharmacist ordered B.P. borax, but apparently received a bag of commercial borax intended for another customer. The stipendiary upheld the view that the defendant had a warranty within the meaning of the Act and dismissed the summons. In another case the sample of borax contained arsenic equal to 1½ gr. per pound of borax. In neither case was it suggested that the defendants had caused the adulteration. The defendant bought borax from two firms, but did not know from which he received the consignment from which the inpector's sample was taken. He always ordered B.P. borax. No question of warranty was raised. The Stipendiary in this case said there was 42 times more arsenic in the sample than there should be. A fine of one guinea was imposed.

It will be noted that in both the above cases the defence was that of "warranty," the defendant being entitled to have the charge dismissed on proving that he "purchased the article in question as the same in nature, substance, and quality as that demanded of him by the prosecutor, and with a written warranty to that effect"; also that he had no reason to believe it to be otherwise, and that he sold it in the same state as when he purchased it. A very large number of cases have turned upon the question as to what constitutes a written warranty within the above section (§ 25 of the Food and Drugs Act, 1875). Invoices have been rejected as such in the past when not quite distinct in their terms. But an invoice stating that the sale was one of B.P. borax was presumably deemed sufficient in the first of the above examples, and in the second it is clear that a defendant, who could not say on oath from which of two consignments from different firms he had taken the sample sold, could not connect with it anything in the nature of a written warranty. For his own protection, as well as for that of the public, a druggist should insist on his wholesale supplier warranting distinctly on his invoices the nature and quality of the goods that he delivers. It is to the public interest that strict proof of a warranty should be insisted upon.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Syndicates of Medical Men.

SINCE you have recently discussed in your columns the ethics and the practicability of some form of combined action on the part of medical men or allied professions, the position in France may be of interest to your readers. There are several syndicates of medical practitioners in France. Their members are practitioners who live in the same district. These syndicates are nearly all grouped in a union: "Union des Syndicats Médicaux de France," the members of which are chiefly general practitioners. Few consultants have so far joined the existing syndicates and there is no independent syndicate of consultants. A syndicate of hospital attendants (orderlies) as well as a syndicate of nurses had originally been set up by those employed in State hospitals; these syndicates later amalgamated in one under the heading: "Syndicat Général du Personnel des Hôpitaux, Hospices et Maisons de Santé de l'Assistance Publique." This syndicate and similar ones in the French Provinces and colonies are grouped in a federation: "Fédération des Services de Santé de France et des Colonies." One of these syndicates is even now fighting a battle against the State on behalf of its members. As reported in a previous letter the decision of the Ministry of Pensions concerning the remuneration of practitioners treating pensioners has been opposed by the Union des Syndicats Médicaux de France, who have decided not to consider the decree of the Ministry of Pensions. The committee of the Syndicat Médical de Paris have urged its members to uphold the decision arrived at by the Union des Syndicats Médicaux de France, and more especially to refuse to fill in and sign forms issued by the Ministry of Pensions. Members of syndicates were asked by the committee to continue to give medical attendance to pensioners, but to treat them as ordinary patients. It has now been proposed by the Union Fédérale des Associations des Mutilés et Réformés de Guerre to refer the decision to a committee consisting of delegates from the Ministry of Pensions, the Associations of Pensioners, and the Medical Syndicates.

Analysis of Water in War Zone.

At a recent meeting of the Société de Médecine Publique et de Génie Sanitaire Mr. R. Wibaux submitted a report on the present organisation of the laboratories exclusively devoted to analysis of waters in the French counties which were invaded during the war. They were set up for this special purpose soon after the war by the Ministère des Régions Libérées. In his report Mr. Wibaux pointed out that originally laboratory lorries were used, but were ultimately replaced by laboratories installed temporarily on any available premises. A motor-car is attached to each temporary laboratory, and it is the duty of a bacteriologist to drive to the various wells in the district to procure the specimens of water to be tested. Mr. Wibaux expressed the wish that such services should remain permanent, and that they should be extended to the whole of the country on a large scale.

Reorganisation of Sanitary Services.

It has been proposed to revise the Medical Act of Feb. 15th, 1902, which deals with the organisation of the sanitary services in France. The French Government has been seeking the opinion of the members of the Académie de Médecine on this matter, and they have been officially asked to express their views. A special committee has been appointed to that effect, and the last meetings of the Academy of Medicine have been largely devoted to debates on the committee's report. In the course of one of these meetings Mr. Léon Bernard emphasised the opinion that sanitary conditions in any area should not be regulated by the local authorities, but should be under the immediate control of a chief medical officer of health, who would superintend an extensive area.

Franco-Anglo-American League against Cancer.

The annual meeting of the Franco-Anglo-American League against Cancer was held at the Faculté de Médecine de Paris on April 19th, Mr. Lerédu, Minister of Hygiene, in the chair. At the opening of the meeting Professor H. Hartmann expressed a vote of thanks to those who had given grants to the League. A report of the managing committee was read by Mr. R. Le Bret, general secretary. Mr. J. Worth, the treasurer, submitted a financial report. Professor C. Regaud suggested that great benefit to the population might ensue if pamphlets were distributed under the joint auspices of the League, the Academy of Medicine, and the Pasteur Institute, pointing out the necessity of early surgical treatment of cancer.

War Memorial for Internes Killed in the War.

A war memorial was unveiled a few days ago at the Hôpital de l'Hôtel-Dieu in memory of the internes who were killed in action. Speeches were made by Mr. Bérard, Minister of Education; Mr. P. Mourier, Director of the Administration de l'Assistance Publique; Mr. H. Roger, Dean of the Faculté de Médecine de Paris; and General Buat, representing the Minister of War. The President of the Republic, the President of the Senate, the Minister of Hygiene, Marshal Foch, Marshal Petain, and the Rector of the Academy were also represented at the ceremony.

May 11th.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

METEOROLOGICAL OFFICE: ADVISORY COMMITTEE ON ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR AUGUST, SEPTEMBER, OCTOBER, NOVEMBER, 1920.

August.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	44	0·59	3·79	3·01	0·88	2·65	10·91	0·57	0·91	—
Archbishop's Park	46	0·12	1·34	1·62	1·19	1·21	5·47	0·51	0·79	0·04
Finsbury Park	44	0·04	0·85	2·40	1·22	1·50	6·01	0·04	0·94	0·03
Ravenscourt Pk.	35	0·15	1·20	2·31	1·08	1·20	5·95	0·30	0·90	0·06
Southwark Park	48	0·10	1·28	2·71	0·99	1·40	7·50	0·52	0·90	0·07
Victoria Park	44	0·06	0·84	1·58	1·12	1·69	5·28	0·40	1·05	0·08
Wandsworth Com.	45	0·05	0·77	1·45	1·19	1·60	5·04	0·38	0·97	0·14
Golden Lane	44	0·01	1·95	2·51	1·05	2·27	7·79	0·57	1·02	0·09
Birmingham—										
Central	50	0·13	6·42	13·76	1·46	3·48	25·25	1·73	0·26	0·05
Aston	42	0·11	2·60	9·49	1·04	2·41	15·35	1·15	0·14	0·05
South-Western	46	0·03	0·89	0·73	0·84	1·79	5·28	0·74	0·14	0·04
Kingston-upon-Hull	37	0·07	2·33	5·77	1·30	3·91	13·38	1·61	0·61	0·07
Liverpool	55	0·09	2·85	5·03	3·04	4·49	15·50	2·72	0·54	0·17
Malvern	18	—	0·10	0·15	0·36	0·61	1·22	0·30	0·07	0·02
Newcastle-on-Tyne	47	0·23	4·32	6·44	0·75	2·43	14·17	0·74	0·56	0·08
Rochdale	73		Ti. :	19·40	Ts. :	6·51	25·61	—	—	—
Rothamsted	32		0·40	0·68	0·39	1·65	3·12	—	—	—
St. Helens	62	0·14	3·66	8·42	1·23	3·54	16·99	1·29	0·69	0·01
Southport—										
Hesketh Park	41	0·03	0·29	0·35	1·42	3·45	5·54	0·26	1·42	0·02
Woodvale Moss	39	—	—	—	—	—	3·88	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	120	0·14	1·50	2·56	2·28	2·52	9·00	1·39	1·29	0·10
Bellahouston Pk.	130	0·47	1·35	1·72	7·63	8·42	19·59	2·23	1·54	0·08
Blythswood Sq.	121	0·30	1·85	3·55	2·19	4·25	12·14	1·61	0·92	0·11
Botanic Gdns.	126	0·39	1·05	2·06	2·40	4·41	10·31	1·51	0·91	0·63
Queen's Park	130	0·57	1·60	2·21	2·38	4·22	10·98	1·69	0·11	0·08
Richmond Park	131	0·24	1·82	3·59	3·66	5·50	14·81	2·04	1·33	0·15
Ruchill Park	126	0·10	1·19	1·85	2·26	3·90	9·30	1·55	1·13	0·07
Tolcross Park	126	1·06	2·90	3·87	5·87	3·66	17·36	1·69	1·03	0·16
Victoria Park	126	0·76	3·17	4·32	3·16	4·56	15·97	2·17	1·34	0·09

September.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	81	0·21	2·35	2·77	2·27	4·54	12·14	1·34	1·15	—
Archbishop's Park	83	0·36	5·48	12·55	1·66	3·06	23·11	1·36	1·20	0·12
Finsbury Park	78	0·04	0·35	1·32	1·89	1·63	5·22	0·85	1·66	0·09
Southwark Park	79	0·31	3·84	5·94	1·72	2·83	14·63	1·08	1·39	0·13
Ravenscourt Pk.	62	0·34	2·18	4·12	1·49	2·65	10·77	0·88	1·23	0·12
Victoria Park	66	0·08	0·83	1·08	1·79	2·04	5·82	0·95	1·02	0·11
Wandsworth Com.	86	0·13	1·89	2·89	3·17	2·63	10·71	6·10	1·68	0·13
Golden Lane	65	0·08	4·53	4·43	2·32	6·97	18·33	3·04	2·60	0·34
Birmingham—										
Central	52	0·18	4·99	15·85	1·86	4·40	27·28	2·18	0·31	0·10
Aston	46	0·08	2·93	5·14	1·23	2·82	12·20	1·26	0·16	0·05
South-Western	54	0·03	0·85	1·73	0·97	2·11	5·69	0·87	0·16	0·05
Kingston-upon-Hull	45	0·07	2·41	5·03	1·78	5·02	14·31	2·34	0·71	0·08
Liverpool	64	0·18	2·50	5·67	1·36	4·06	13·77	1·97	0·36	0·10
Malvern	62	—	0·10	0·28	0·41	1·64	2·43	0·67	0·12	0·01
Newcastle-on-Tyne	37	0·30	3·22	7·33	1·40	2·95	15·20	1·39	0·44	0·11
Rochdale	71		Ti. :	19·40	Ts. :	6·21	25·61			
Rothamsted	61	—	0·53	0·85	1·08	1·64	4·10	—	—	—
St. Helens	72	0·03	1·32	1·88	1·80	2·34	7·37	1·43	0·88	0·01
Southport—										
Hesketh Park	78	0·04	0·65	0·65	1·17	3·31	5·82	0·59	1·10	0·05
Woodvale Moss	86	—	—	—	—	—	6·98	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	67	0·09	1·87	2·99	2·14	1·98	9·07	1·39	0·88	0·16
Bellahouston Pk.	80	0·17	2·47	2·79	1·23	4·00	10·66	1·00	0·87	0·17
Blythswood Sq.	68	0·17	2·09	3·11	5·04	5·64	16·05	1·58	1·23	0·58
Botanic Gdns.	67	0·24	2·46	4·46	1·46	4·08	12·70	1·34	0·61	—
Queen's Park	70	0·07	1·19	1·57	1·15	3·80	7·78	0·92	0·76	—
Richmond Park	63	0·26	3·40	7·25	1·39	3·90	16·20	1·51	0·52	0·06
Ruchill Park	108	0·12	1·49	3·02	0·68	2·66	7·97	0·88	0·65	0·12
Tolcross Park	68	0·18	2·34	4·04	1·22	3·70	11·48	1·29	1·32	0·10
Victoria Park	80	0·11	1·75	2·45	1·22	3·44	8·97	1·77	0·53	0·16

October.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	29	0·22	1·89	2·63	2·07	3·22	10·03	1·06	0·79	0·03
Archbishop's Park	26	0·09	9·23	1·42	1·38	3·28	15·40	1·55	0·72	0·12
Finsbury Park	28	0·11	1·01	3·16	0·95	2·31	7·54	1·10	0·55	0·04
Ravenscourt Pk.	31	0·20	1·78	3·81	1·02	2·06	8·87	0·90	0·73	0·08
Southwark Park	26	0·12	2·59	3·23	1·16	2·52	9·62	1·20	0·76	0·07
Victoria Park	33	0·14	2·15	4·33	1·05	2·04	9·71	0·90	0·68	0·06
Wandsworth Com.	19	0·23	3·07	6·32	1·12	1·66	12·40	0·63	0·76	0·04
Golden Lane	31	0·09	3·07	4·21	1·42	3·68	12·22	1·56	0·73	0·13
Birmingham—										
Central	67	0·19	6·18	16·60	1·74	4·22	28·93	2·31	0·34	0·13
Aston	70	0·06	1·61	3·11	1·34	3·18	9·30	1·66	0·28	0·07
South-Western	70	0·03	0·92	1·91	0·84	2·21	5·91	1·01	0·35	0·04
Kingston-upon-Hull	35	0·06	3·33	4·15	1·87	5·06	14·47	2·50	0·57	0·07
Liverpool	51	0·15	2·31	5·49	2·44	3·77	14·14	2·23	0·39	0·10
Malvern	62	Tr.	0·15	0·38	0·64	1·90	3·07	0·61	0·12	0·02
Newcastle-on-Tyne	36	0·43	4·44	12·30	3·12	4·36	24·65	2·41	0·52	0·09
Rochdale	29	—	—	—	—	—	20·89	—	—	—
Rothamsted	37	—	0·40	0·67	1·40	2·11	4·58	—	—	—
St. Helens	27	0·03	0·87	0·98	1·54	2·04	5·46	0·97	0·77	0·03
Southport—										
Hesketh Park	24	0·04	0·53	0·43	0·60	1·07	2·67	0·34	0·33	0·02
Woodvale Moss	28	—	—	—	—	—	3·53	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	34	0·06	0·91	1·26	0·44	0·63	3·30	0·57	0·38	0·08
Bellahouston Pk.	29	0·26	2·12	3·02	0·92	1·50	7·86	0·45	0·30	0·16
Blythswood Sq.	34	0·31	2·12	3·29	1·80	2·83	10·35	1·00	0·64	0·18
Botanic Gdns.	39	0·11	1·49	1·94	0·93	1·46	5·93	0·88	0·26	0·05
Queen's Park	36	0·17	1·30	1·73	1·45	1·97	6·62	0·84	0·34	0·07
Richmond Park	32	0·25	3·09	3·86	1·54	3·06	11·80	1·66	0·36	0·12
Ruchill Park	42	0·07	0·99	1·47	0·81	1·76	5·10	0·70	0·42	0·10
Tolcross Park	30	0·19	1·73	1·83	1·21	1·62	6·60	0·82	0·29	0·06
Victoria Park	44	0·24	1·47	2·34	0·66	1·41	6·12	1·00	0·28	0·11

November.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Insoluble matter. Carbonaceous other than tar.	Insoluble matter. Ash.	Soluble matter. Loss on ignition.	Soluble matter. Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Included in soluble matter. Chlorine (Cl).	Included in soluble matter. Ammonia (NH_3).
ENGLAND.										
London—										
Meteorological Office	26	0·21	2·23	0·44	0·97	1·89	9·67	0·89	0·62	0·59
Archbishop's Park	23	0·12	1·97	3·26	2·32	4·07	11·74	2·22	0·69	0·13
Finsbury Park	25	0·15	1·78	4·10	0·86	1·84	8·73	0·96	0·40	0·07
Ravenscourt Pk.	28	0·27	2·69	4·05	1·22	1·91	10·14	1·26	0·43	0·10
Southwark Park	21	0·34	3·86	5·31	1·06	1·95	12·52	1·06	0·43	0·08
Victoria Park	23	0·13	2·71	3·48	0·97	1·79	9·08	0·95	0·39	0·07
Wandsworth Com.	25	0·14	1·92	2·42	1·18	1·38	7·04	0·73	0·49	0·07
Golden Lane	25	0·09	2·63	3·74	1·29	3·69	11·44	1·66	0·70	0·18
Birmingham—										
Central	18	0·15	3·99	9·09	1·63	3·38	18·24	1·91	0·18	0·04
Aston	17	0·06	1·90	5·15	0·90	2·31	10·32	1·18	0·14	0·01
South-Western	21	0·02	0·68	1·46	0·43	1·37	3·96	0·63	0·11	0·01
Kingston-upon-Hull	15	0·34	2·89	4·37	1·81	4·81	14·22	2·48	0·24	0·05
Liverpool	25	0·24	2·69	7·14	1·58	3·29	14·94	1·61	0·27	0·09
Malvern	22	—	0·18	1·00	0·64	1·87	3·69	0·77	0·25	0·02
Newcastle-on-Tyne	22	0·42	2·95	5·39	0·88	2·74	12·38	1·15	0·45	0·05
Rochdale	47* / 44† / 51‡						14·47* / 6·49† / 14·62‡			
Rothamsted	41	—	0·48	0·76	1·24	1·95	4·43	—	—	—
St. Helens	30	0·16	3·53	5·09	0·96	3·34	13·08	1·22	1·11	—
Southport—										
Hesketh Park	34	0·10	0·68	0·77	0·51	2·40	4·46	0·59	0·83	0·02
Woodvale Moss	28	—	—	—	—	—	3·29	—	—	—
SCOTLAND.										
Glasgow—										
Alexandra Park	50	0·18	1·47	1·75	1·68	2·78	7·86	1·08	2·50	0·10
Bellahouston Pk.	104	0·23	1·52	2·35	3·72	5·32	13·14	2·05	2·51	0·21
Blythswood Sq.	91	0·16	2·98	4·14	3·67	7·49	18·44	2·41	2·59	0·18
Botanic Gdns.	90	0·15	1·80	3·30	2·12	6·03	13·40	1·90	2·11	0·14
Queen's Park	66	0·19	1·70	3·18	1·07	4·19	10·33	1·20	1·68	0·05
Richmond Park	64	0·38	3·33	5·27	2·77	7·67	19·42	2·94	1·73	0·09
Ruchill Park	112	0·17	1·58	2·29	0·74	6·54	11·32	2·35	2·49	0·11
Tolcross Park	83	0·18	3·34	3·24	1·94	5·78	14·48	2·21	2·05	0·13
Victoria Park	117	0·09	1·73	2·47	2·36	7·62	14·27	2·66	2·79	0·22
Stirling	77	0·13	1·82	2·00	2·77	3·98	10·70	0·86	2·00	0·13

Ti. = Total insoluble. Ts. = Total soluble. Tr. = trace. * East side of town. † West side of town. ‡ Town.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) 1 g. per sq. metre; (*d*) 1/1000 mm. of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables. The analyses of the rain and deposit caught in the gauge at the Meteorological Office were made in THE LANCET Laboratory.

Correspondence.

"Audi alteram partem."

EARLY DIAGNOSIS IN DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—For the past two years it has been impressed upon me that sufferers from diphtheria have been arriving at my hospital, on the whole, rather later in the disease than was the case for a good many years previously. The death-rate in 1919 was 13·6 per cent., and I have to go back to 1901 to find a death-rate either exceeding or equalling it. In 1920 the death-rate was 11·2, and I have to go back to 1903 to find that exceeded or equalled. Certainly the death-rates of 1919 and 1920 were higher than one would have expected, and naturally one looks for some explanation. A simple one would be that the disease was more severe in type, but though I am not prepared to deny that the type may have been somewhat more severe I am satisfied it was not the main cause, if, indeed, it affected it at all materially. The real explanation appears to be what I have just called attention to—the fact of so many patients arriving at the hospital after the disease was well advanced and without previous antitoxin treatment.

This slower recognition of diphtheria of late has puzzled my mind, and I have striven to find the explanation, but evidently no one reason by itself gives a satisfactory explanation. It is not to be assumed that only the milder forms come in late; it is any kind of diphtheria, and quite commonly the most severe. This cannot all be laid at the door of the practitioner, for it is quite clear that on many occasions he is not called in at the commencement of the disease, but for what proportion this accounts he would naturally be a better judge than I. There can be no doubt, however, that delay is greatly attributable to awaiting the result of a bacteriological examination. At first sight it seems curious that this should have increased, but it may be that so many practitioners were not in civil practice during the war, and consequently had not the opportunity to study diphtheria clinically.

Yet I do not think that is the sole cause of the tendency to wait for bacteriological examination, for some scientific books lay too much stress on the finding of the bacillus, and I have even been told by a medical man that the medical officer of health expected it. I do not know how far the medical officer of health may be considered responsible, but an excellent scientific text-book states that examination of the membranous exudation with the demonstration of the presence of the diphtheria bacillus is the only reliable method of diagnosis. This kind of erroneous statement might best be met by the epigrammatic remark of an authority on diphtheria: "Were it not that the diphtheria bacillus had given us antitoxin, it would have been well had it never been discovered." I have no wish to discourage bacteriological examination; indeed, I always carry it out, but to let treatment wait upon the result of the examination means delay, and delay in diphtheria often means death. For 15 years MacCombie kept records of the diphtheria death-rates according to the day on which the disease was treated with antitoxin, and as these results were founded on over 7000 cases they may be taken as conclusive. The death-rate when antitoxin was given on the first day was 0·5 per cent.; on the second day 4 per cent.; on the third day 10 per cent.; on the fourth day 15 per cent.; and on the fifth and succeeding days 16 per cent.

My own experience of treatment on the first day has not been quite so good as MacCombie's, but his figures demonstrate what waiting without treatment for a bacteriological examination means. Moreover, it must be remembered that the bacteriologist, at all events at first, may fail to find the bacillus in well-marked diphtheria, and maybe another swab is taken with further delay. As a matter of fact, failure to find the bacillus in a culture taken early in the disease is not uncommon. It may not be found even in a second or third culture, and rarely not at all. Failure to find the bacillus in purely laryngeal diphtheria is common and well known, but perhaps it is not so well known that in the severest form of faucial diphtheria cultures taken on the first day are not uncommonly negative. On the other hand, the case for examination may be a carrier and the finding of the bacillus of no value. Nevertheless, a culture should always be taken, and care should be exercised in the choice of examiner, the dabbler in bacteriology being avoided.

However, in milder forms of faucial disease with a suspicion of diphtheria, sometimes the question will arise whether one ought to let treatment wait for the culture result. The difficulty is often great, for the point one has to decide in such a case is whether the disease will continue mild or develop into a severe attack. In my experience this is difficult to do without occasional error, and I think there can be no doubt that if the clinical evidence favours diphtheria the patient should be treated for that disease at once. In practice it comes to this: if one is sufficiently experienced to say that a given patient will certainly recover if treatment is postponed to the second or third day, then one may wait, but if one cannot say so then it is one's duty to give antitoxin.—I am, Sir, yours faithfully,

FREDERIC THOMSON.

North-Eastern Hospital, Tottenham, N., May 12th, 1921.

THE INTERNECINE VENEREAL CAMPAIGN.

To the Editor of THE LANCET.

SIR,—Lord Gorell states in his letter which you printed in your issue of May 7th that there is now admitted to be but one point of difference between the two societies. In order that your readers may appreciate the extent of the difference it is necessary for them to read our letter to Lord Gorell of April 22nd, which was not published in full in THE LANCET. We adhere to the position defined in that letter, and are still ready to meet the National Council for Combating Venereal Diseases according to our letter to the Bishop of Birmingham of Feb. 25th, accepting his invitation to a round table conference, on the understanding that the National Council for Combating Venereal Diseases were prepared to take action forthwith on the terms of the report of the Bishop's committee.

The National Council for Combating Venereal Diseases did not accept this invitation, therefore the conference did not take place.—We are, Sir, yours faithfully,

WILLOUGHBY DE BROKE,
President of the Society for the Prevention of Venereal Disease.
H. BRYAN DONKIN,
Vice-Chairman, Executive Committee, S.P.V.D.
H. WANSEY BAYLY,
Honorary Secretary, S.P.V.D.

Harley-street, W., May 13th, 1921.

A LEARNED LAYMAN ON VENEREAL DISEASE.

To the Editor of THE LANCET.

SIR,—Many of your readers have read the recent series of articles in the *Morning Post* by Mr. Harold Cox, entitled "The Path to Pauperism." They are written with interest and power, and deservedly arrest attention. The skill which has enabled their author to exercise such influence is to be envied; but, unfortunately, we possess in these articles a striking example of how one, who possesses ability both as a publicist and a literary man, can become by deficient knowledge lacking in accuracy. This is all the more regrettable as the subject of venereal disease is so clearly a public and not only a professional matter.

In the *Morning Post* of April 28th Mr. Cox treats of the Ministry of Health under the three headings of (1) Departmental Rivalries, (2) Venereal Disease, (3) Maternal and Child Welfare; and it is the second of these sections—viz., that dealing with venereal disease

—on which I desire to comment. The problem of venereal disease in relation to the nation's welfare is an extremely complex one, in respect to both its medical and sociological aspects; and Mr. Cox exhibits a degree of knowledge which is superficial, and therefore dangerous, especially in view of the prestige conferred on his statements by his own position and that of the journal in which his words appeared.

Mr. Cox, having previously indicted the Ministry of Health on the charge of being indifferent "to the true interests of the health of the nation," proceeds to level a similar charge against that body with regard to its attitude towards venereal disease. He attracts our attention by stating that syphilis and gonorrhœa are "the most easily preventable of all diseases." He fails, however, to indicate the nature of those preventive measures which so easily secure success. He then considers the attitude of "two private societies." His description of the Society for the Prevention of Venereal Disease is imperfect and substantially fails to do justice to that body. He writes that it "adopts the commonsense view that the prevention of venereal disease is an obligation resting upon the individual and also a matter of immense importance to the nation. It, therefore, demands that facilities should be provided for individuals to obtain the knowledge and the means by which venereal disease can be prevented." The Society for the Prevention of Venereal Disease, in addition to zeal for the adoption of medical measures, also recognises the importance of the ethical and religious factors in the prevention of venereal disease, and Mr. Cox fails as a critic by omitting so important a fact in relation to this Society.

He then proceeds to deal with the National Council for Combating Venereal Diseases, saying:—

"The other Society takes the view that nothing should be done to help in the prevention of the disease, but that as soon as the disease has been acquired public money should be spent in trying to cure it. The latter Society receives large subsidies provided out of the taxpayers' money to enable it to advertise itself. For this purpose, as Dr. Addison confessed in the House of Commons, the country has had to pay about £13,000 a year for the last three years. How much is to be spent in the current year on advertising this futile Society has not yet been announced, but the total sum asked for by the Ministry of Health and similar bodies in Scotland and Ireland on account of venereal disease is £512,550. None of this money is to be spent on effective methods of prevention. The so-called Ministry of Health prefers that people should first run the risk of getting the disease, and that the Department should then try to cure them. This policy is apparently due to theological as well as departmental considerations. Dr. Addison and his staff seem to have held the view that venereal disease is an affliction designed by Providence as a penalty for sin. Historically that is a curious view, because syphilis, at any rate, did not appear in this country till late in the Middle Ages, and it may be presumed that there was sin before that time. Apart from this historical fact, the Addisonian theory is still difficult to understand. In effect Dr. Addison and his theological and medical advisers have been saying, "Since disease is a punishment for sin, we will not allow people to know how they can prevent it. Nevertheless, we will do our best to cure them at the taxpayers' expense when they have acquired it."

Mr. Cox thus accuses both the Ministry of Health and the N.C.C.V.D. of refusing to take steps in respect to the prevention of venereal disease, while spending public money in attempting to cure those who have fallen victims. He has not thought it worth while to inquire what views are held on this matter by either the Ministry or the National Council. Now both the Ministry and the Council realise that the fundamental cause of venereal disease is the indulgence in promiscuous sexual intercourse, and also that it is their duty to diminish causes rather than treat symptoms. They know that much of the promiscuous sexual intercourse which gives rise to venereal disease is due to the lack of efficient education of the young, of adolescents, and even of adults in sexual matters. They rightly devote, therefore, a substantial portion of their attention towards dissemination of such instruction as will tend to prevent the occurrence of those conditions, which experience has shown to be provocative of promiscuous sexual intercourse, and therefore of venereal disease. The Ministry and the Council are not irrational idealists, nor do they confine their efforts to educational methods. They also advocate efficient cleansing by those who will wilfully or carelessly persist in placing themselves in danger. Mr. Cox's statement as to the N.C.C.V.D. taking the view "that nothing should be done to help in the prevention of the disease" is untrue.

Turning to the financial aspect of the question, Mr. Cox has no idea as to the cost to the country of venereal disease. The sums spent by the adoption of far-seeing and rational methods for reducing the cause of these diseases will prove the means of saving the country a vast expense. The propaganda work carried out by the National Council is of estimable value, for it is directed to the very root of the evil. To regard this money as being spent "in advertising this futile Society" merely because an important branch of their work is carried out through the channels of the press is childish in the extreme. The remarks as to venereal disease being regarded by the N.C.C.V.D. as a punishment for sin, have as far as I can find, no basis, and their humour becomes malicious. Mr. Cox has, I think, trustfully accepted statements concerning the bodies which he abuses without understanding their activities. His articles produced under the ægis of so respected a journal, and signed by so respected a publicist are capable of doing great damage to the nation.

I enclose my card, from which you will see that I ought to know my subject.

I am, Sir, yours faithfully,

May 14th, 1921. A MORPHOLOGIST.

SURGICAL SHOCK.

To the Editor of THE LANCET.

SIR,—In THE LANCET of May 7th a review of "Principles of General Physiology" by Professor W. M. Bayliss mentions the theory that in surgical shock a widespread dilatation of capillaries leads to a pooling of blood. I believe that surgeons who have seen many cases of shock have failed to find pooling of blood in capillaries. Would Professor Bayliss or your reviewer state where, in a human subject suffering from surgical shock, these dilated capillaries are to be found? I am, Sir, yours faithfully,

Plymouth, May 8th, 1921. C. HAMILTON WHITEFORD.

Professor Bayliss, to whom we referred Mr. Whiteford's inquiry, replies as follows:—

I thank you for giving me the opportunity of making a few remarks on Mr. Whiteford's letter. He does not tell us what evidence of pooling in capillaries surgeons have looked for and failed to obtain. Since the effect in question is not confined to the capillaries of any particular region and the total volume of these vessels, compared with the rest of the vascular system, is enormous, it is clear that a dilatation too small to be detected by direct observation may produce a large increase in the total volume. The evidence, in the nature of things, must be more or less indirect. It would be impossible to give it adequately in a brief account, and those interested may be referred to the special reports of the Medical Research Council, Nos. 25, 26, and 27, especially the two latter. In summary, it may be given thus. Observations during the war on shock unaccompanied by hæmorrhage showed that the low blood pressure was not due to any heart effect, nor to pooling of blood in arteries or veins. But it was found by the vital red method that the blood in actual circulation was greatly reduced. The dilatation of arteries and veins having been ruled out, it could only be in the capillaries. Other confirmatory evidence was obtained and the conclusion was greatly strengthened by the discovery of toxic substances having the required action. In addition to the literature quoted in the reports mentioned, Mr. Quénu's book, "Toxémie Traumatique," deals with this aspect of wound shock.

West Heath-road, N.W., May 12th, 1921.

THE DANGER OF ATHLETICS FOR GIRLS AND WOMEN.

To the Editor of THE LANCET.

SIR,—I have read with great pleasure Miss C. Cowdroy's letter in THE LANCET of May 14th under this title. My experience leads me to agree with her entirely. I have seen a number of girls and young women whose health has been permanently damaged by indulgence in strenuous athletics, and even if they escape physical injury I find they have degenerated into beings of neutral sex who are unfitted for either the work of men or women. Whilst writing on this subject I should like to mention another harmful and dangerous craze. Physical jerks for the middle-aged has done a great deal of harm to many people. The average man or woman of 50 can keep perfectly fit if he or she does not over-eat or drink too much and takes a good amount of walking exercise daily. If they do this there will be no need for "physical jerks." If they do not they may easily "jerk" themselves into their graves.

I am, Sir, yours faithfully,

LESLIE THORNE THORNE, M.D.

Harley-street, W., May 14th, 1921.

INTRAVENOUS INJECTION OF STIBENYL IN KALA-AZAR.

To the Editor of THE LANCET.

SIR,—With reference to the dosage of stibenyl in the treatment of kala-azar and other tropical diseases raised in Dr. P. Manson-Bahr's letter in your issue of May 7th, it ought to be made clear that each batch is tested for toxicity by the Medical Research Council, and all material issued for use conforms with their standard. Stibenyl is tested on mice, as in the case of salvarsan, and the dose that must be tolerated is 0·15 mg. per gramme body-weight used intravenously in a concentration of 1 per cent. The maximum dose that has been suggested for an adult person is 0·6 g., which should allow a very large margin of safety.

We are, Sir, yours faithfully,

ALLEN AND HANBURYS, LTD.

Bethnal Green, London, E., May 12th, 1921.

The Services.

ARMY MEDICAL SERVICE.

Cols. H. N. Dunn (late R.A.M.C.) and H. J. M. Buist retire on retired pay.

ROYAL ARMY MEDICAL CORPS.

Major S. McK. Saunders is restored to the establishment.

Capts. G. K. Maurice and W. Pailthorpe are seconded for service with the Egyptian Army.

Capt. A. W. Bevis retires, receiving a gratuity.

Temp. Capts. T. M. Richardson and V. H. L. MacSwiney relinquish their commissions and retain the rank of Captain.

TERRITORIAL FORCE.

Major J. G. McCutcheon (late R.A.M.C., Special Reserve) to be Captain, and relinquishes the rank of Major.

Captains to be Majors: J. G. McCutcheon, G. E. J. A. Robinson, F. R. M. Heggs, and E. L. D. Dewdney.

Major F. W. Kendle, T.D. resigns his commission and retains the rank of Major with permission to wear the prescribed uniform.

Supernumerary for Service with O.T.C.—Major W. D. Sturrock, from General List, to be Major, and to command the Field Ambulance Section, Oxford University Contingent, Senior Division, O.T.C.

TERRITORIAL FORCE RESERVE.

Capt. A. Coleridge to be Major.

DEFENCE FORCE.

To be temporary Majors: J. M. Cowan and W. Haig. To be temporary Captains: J. M. Chrystie, A. H. D. Smith, R. Morshead, A. G. Williams, A. E. H. Reid, D. C. Graham, and V. T. W. Eagles. To be temporary Lieutenants: E. H. Mayhew, J. E. Sinclare, and A. N. Rushworth.

2nd Highland Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: J. W. Tocher. To be temporary Major: W. F. T. Haultain. To be temporary Captain: H. J. Rae. To be temporary Lieutenant: H. J. Dawson.

1st London Field Ambulance (D.F.).—O. W. McSheehy (Major, R.A.M.C.) is granted the rank of temporary Lieutenant-Colonel while commanding a Field Ambulance. To be temporary Major: E. Knight. To be temporary Captains: A. B. Mount, A. L. Robinson, and R. J. Arundel.

1st London Sanitary Section (D.F.).—To be temporary Captain: H. C. Sands.

2nd London Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: H. G. Haynes. To be temporary Captains: M. Coughlan and W. Hassard. To be temporary Lieutenant: G. W. Almeyde. To be temporary Quartermaster with the rank of Captain: A. J. H. Knight.

3rd London Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: M. H. Allen. To be temporary Captain: L. J. G. Carre.

4th London Field Ambulance (D.F.).—To be temporary Captain: C. H. Welch.

5th London Field Ambulance (D.F.).—To be temporary Lieutenants: J. R. K. Flemming and H. W. Collins.

6th London Field Ambulance (D.F.).—To be temporary Captain: E. H. Bingley.

2nd (London) Divisional Sanitary Section (D.F.).—To be temporary Captain; H. Brian-Pearson.

1st (Lowland) Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: E. S. Forde. To be temporary Major: E. P. Cathcart. To be temporary Captain: J. K. Rennie. To be temporary Lieutenants: A. H. Jacobs and N. M. D. Fox.

2nd (Lowland) Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: G. B. Fleming. To be temporary Major: J. R. C. Greenlees.

3rd South Midland Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: T. A. Green. To be temporary Major: D. S. A. O'Keeffe. To be temporary Captains: A. D. Symons and J. C. Brasher. To be temporary Lieutenant: B. A. Astley-Weston.

1st East Anglian Field Ambulance (D.F.).—To be temporary Captains: A. G. Atkinson and H. F. Gilmour.

2nd East Anglian Field Ambulance (D.F.).—To be temporary Captain: W. T. G. Boul.

3rd (Highland) Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: G. W. Miller. To be temporary Major: W. A. Robertson. To be temporary Captain: J. Kinnear.

1st (Home Counties) Field Ambulance (D.F.).—To be temporary Captain: E. A. Houchin.

2nd (Home Counties) Field Ambulance (D.F.).—To be temporary Captain: R. A. Freeman.

3rd (Home Counties) Field Ambulance (D.F.).—To be temporary Captain: V. E. Negus.

3rd (Welsh) Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: C. L. Isaac.

1st Wessex Field Ambulance (D.F.).—To be temporary Lieutenant-Colonel: A. Cary. To be temporary Major: R. Ward.

ROYAL AIR FORCE.

T. P. Harpur is granted a temporary commission as Flying Officer.

INDIAN MEDICAL SERVICE.

The King has approved the grant of the rank of Captain to the undermentioned on relinquishing their temporary commissions: Moses Solomon, Jamna Das, Jitendra Kumar Banerji, Ullah Anantthaya, and Ram Chandra. And the honorary rank of Lieutenant-Colonel to the undermentioned on relinquishing his temporary and honorary commission: Raghavendra Row.

The King has approved the retirement of the following officers: Brevet Col. C. M. Goodbody and Lieut.-Col. S. E. Prall.

DEATHS IN THE SERVICES.

Sir Robert William Jackson, C.B., Deputy Surgeon-General, retired, died on May 12th at Dublin in his ninety-fourth year. He entered the Army Medical Department in 1854, served in the Crimea, and was present at the fall of Sevastopol. He served throughout the Indian Mutiny, and was present at the relief of Lucknow and at the Battle of Cawnpore (medal with three clasps). He also took part in the Ashanti war (mentioned in despatches), and saw service in South Africa. In Egypt he was present at the Battle of Tel-el-Kebir (medal with clasp and bronze star). He retired in 1882, in which year he was knighted.

NORTH EUROPEAN CONFERENCE ON VENEREAL DISEASES.—This Conference opens at Copenhagen to-day (May 20th) with an address by Sir David Henderson, Director-General of the League of Red Cross Societies. The following special problems are to be presented: 1. The supply and cost of arsenical compounds for the treatment of syphilis; the possibility of establishing an international standard for the export and import of such compounds. Discussion to be opened by Dr. Kristian Grön for the Norwegian Red Cross Society. 2. The provision in important ports, by international agreement, for the treatment of cases of venereal diseases among sailors, and measures to be taken in connexion therewith. Discussion to be opened by Lieutenant-Colonel L. W. Harrison for the British Red Cross Society. 3. The part of the Red Cross in combating venereal disease, its relation to Government and voluntary agencies. Discussion to be opened by Professor C. E. A. Winslow for the League of Red Cross Societies. 4. Medical measures for the prevention of venereal diseases. Discussion to be opened by Dr. Jersild for the Danish Red Cross Society. The British delegates to the Conference are Colonel Harrison, Dr. F. N. Kaye Menzies, and Mrs. Neville Rolfe. The German Red Cross is represented by Professor J. Jadassohn, Professor Galewsky, and Professor F. Pinkus.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, MAY 11TH.

Public Health (Tuberculosis) Bill.

THE Public Health (Tuberculosis) Bill was read a third time and passed. (The measure received the Royal Assent on the following day.)

THURSDAY, MAY 12TH.

Criminal Law Amendment Bill.

The Earl of CRAWFORD, replying to the Bishop of London, who asked whether the Government would be able to grant facilities for the passing of the Criminal Law Amendment Bill this session, said that if the measure continued to maintain the non-controversial character with which it left their lordship's House the Government would be glad to do its best at a later stage of the session to pass it into law. No more definite indication than this could be given owing to the fact that there was considerable pressure on the time of the House of Commons.

HOUSE OF COMMONS.

TUESDAY, MAY 10TH.

Rabies in England.

Mr. HUGH MORRISON asked the Minister of Agriculture whether there had been at least 18 cases of rabies in England since January last as against only three cases for the same period in the previous year; whether a dog infected from rabies had been found 70 miles from its home; whether dogs who had developed the disease after being watched were in confinement for seven and a half months; and, if so, was he satisfied that the present regulations were sufficiently stringent to stamp out the disease.—Sir A. GRIFFITH-BOSCAWEN replied: (1) The number of cases of rabies confirmed in Great Britain since Jan. 1st last is 17, but 3 of these refer to dogs which had died in the previous year. The actual number of cases this year is therefore 14 compared with 4 during the corresponding period of last year. (2) Dogs suffering from rabies have been known to wander for 70 miles from their homes, but the longest distance which a mad dog has wandered recently in this country is approximately 50 miles. (3) In one case only in this country in recent outbreaks has the disease taken seven and a half months to develop. The average period of incubation for the series has been two and a half months, and no case has arisen in a dog after its release from quarantine for the prescribed period of six months. The Ministry is satisfied that the existing regulations are adequate.

WEDNESDAY, MAY 11TH.

Orthopædic Hospital at Hammersmith.

Sir WILLIAM BULL asked the Minister of Pensions whether, in view of the difficulty experienced by the Hammersmith board of guardians in finding suitable accommodation for the sick poor of that borough, due to the exclusive occupation of the workhouse and infirmary in Ducane-road by the Ministry of Pensions for use as an orthopædic hospital, and in view of the fact that the full accommodation of this establishment, 800 cases, did not now appear to be required, the greatest number accommodated at any one time since Jan. 1st, 1921, having been 686 cases, he could give a definite assurance that these premises would be restored to the Hammersmith board of guardians on Jan. 1st, 1922, as indicated in conferences which had taken place between representatives of the Ministry and of the local authorities held variously since June, 1918.—Major TRYON (Parliamentary Secretary to the Ministry of Pensions) replied: The matter is under consideration and I am unable to make a definite statement at the present moment. I am communicating with my honourable friend.

Food for Children Under Five.

Mr. TYSON WILSON asked the Minister of Health whether, in view of the widespread distress in the country, he would cancel Circular M. and C. W. 185, issued March 31st, 1921, and re-issue Circular M. and C. W. 4, of August 9th, 1918, so that maternity and child welfare committees might provide children under 5 years of age with food.—Sir ALFRED MOND replied: Circular 185 does not alter the conditions previously prescribed on which food may be supplied to children under 5, except in regard to the supply of milk, which under the Circular is to be supplied free, or at less than cost price, only in necessitous cases. In the circumstances no purpose would be served by cancellation of the Circular.

Hydrophobia and the Pasteur Treatment.

Mr. FREDERICK GREEN asked the Minister of Health how many persons bitten by alleged or suspected mad dogs since the first case of rabies was notified in this country after the war had refused the Pasteur treatment, and if any of those persons had contracted hydrophobia.—Sir ALFRED MOND replied: So far as I am aware there have been only two cases in this country since the armistice in which persons bitten by dogs which were reasonably suspected to be rabid have refused the Pasteur treatment. Neither of these persons developed hydrophobia.

Superannuation of Local Government Officials.

Mr. MYERS asked the Minister of Health whether he would be able at an early date to give effect to the promise made by his predecessor and introduce a Bill making provision for a national scheme of superannuation for Local Government officials.—Sir ALFRED MOND replied: As I have previously stated in reply to questions, the Government regret that they cannot proceed with this matter at the present time in view of the charges which the scheme would impose upon the rates.

Suffering of Mothers and Children in Ireland.

Viscountess ASTOR asked the Chief Secretary to the Lord Lieutenant of Ireland whether he had received representations as to unnecessary suffering caused to expectant mothers and to women with new-born children through certain police and military regulations in Ireland; and whether he would consider the appointment of a committee of medical and infant-welfare experts to consult with the military authorities as to the best methods of obviating or minimising such suffering.—Mr. HENRY (Attorney General for Ireland) replied: My right honourable friend the Chief Secretary has received no representations of this nature and has no reason to think that there are any grounds on which the appointment of a committee such as is suggested would be justified. He will be glad, however, to consider any representations that may be made to him on the matter. All doctors and nurses who choose to apply for curfew permits can obtain them. Doctors and nurses are also expressly exempted from motor restrictions and can use motor vehicles without restriction as to distance or time.

Maternity Welfare.

Captain WEDGWOOD BENN asked the Prime Minister the amount which would be involved by the State annually by the ratification of the maternity convention, as estimated by the Government; upon what weekly sum the Government had based the full and healthy maintenance grant for mother and child; and whether the annual estimate had been worked on a contributory or non-contributory basis.—Sir ALFRED MOND (Minister of Health) replied: I am having laid as a White Paper a Memorandum by the Government Actuary on the Washington Draft Convention concerning the employment of women before and after childbirth. The Memorandum deals with the points raised by the honourable Member.

Captain WEDGWOOD BENN asked the Minister of Health the number of women industrially employed who received maternity benefits under the Health Insurance Act for the last year for which returns were available; and the total amount paid out in maternity benefits for industrially employed women in that year.—Sir ALFRED MOND replied: The information as to numbers is not available, and could only be obtained by calling for a special return from all societies and branches. The amount paid as maternity benefit to employed women in England and Wales for the year 1920 in respect of their own insurance was approximately £230,000. In addition, £160,000 was paid as maternity benefit to women who were entitled to special benefits on cessation of employment on or after marriage.

Dentists Bill.

The Dentists Bill was read a second time and committed to a Standing Committee.

Scottish Midwives Order.

The House approved the Scottish Board of Health (Midwives (Scotland) Act, Transfer of Powers from Secretary of Scotland) Order, 1921.

THURSDAY, MAY 12TH.

MINISTRY OF HEALTH VOTE.

The House went into Committee of Supply on a vote of £15,245,098 for the expenses of the Ministry of Health, Mr. JAMES HOPE in the chair.

Sir ALFRED MOND (Minister of Health) said the activities of the Ministry spread over a wide field, and, dealing with very novel propositions under difficult conditions, naturally afforded room for legitimate criticism. But a great deal of the criticism had neither been constructive nor well informed, nor had it made any endeavour to deal with the difficulties of the situation with which his predecessor and he had been faced. In spite of their difficulties they had succeeded in making a substantial reduction in the estimates this year of over £3,000,000. He was applying himself to the task of seeing whether still further economies could be made. Considerable progress had been made in housing. They were now trying to limit the present scheme,

cutting down in outlying districts where the housing need was not so great, and concentrating on the great industrial centres in which the housing need was greatest. He would give 300,000 as the gross figure of houses of different classes. If, however, fewer could be done with he would be prepared to cut it down to the minimum requirements. A subject which had aroused a good deal of criticism and comment in the press was the medical establishment of the Ministry. Whereas the old Local Government Board had a relatively small medical staff and relatively little to do in the way of medical duties, the National Health Insurance had a much larger staff, and when the two were joined together that automatically increased the staff of the Ministry of Health. On April 1st, 1919, the number of pensionable medical men in the Local Government Board and the Insurance Commission of England and Wales was 46. The number at present in the Ministry was 59, or a difference of 13, distributed as follows: Maternity and Child Welfare, 2; Tuberculosis, 2; Venereal Disease, 2; Port Isolation Hospitals, 3; Statutory Medical Services and Intelligence Work, 3; and work taken over from the Home Office, 1. These were additional functions to the work which was being looked after by the medical staff of the Ministry of Health, apart from the newly established regional officers. There were no less than 1800 sanitary authorities which looked to the Ministry for guidance, 114 port authorities, 646 Poor-law unions, 1029 isolation hospitals for infectious diseases, and 4220 public vaccination districts which had to be inspected. There were a vast number of maternity centres and tuberculosis sanatoriums to which the Ministry gave grants, and which also had to be inspected. It might be considered cheaper to hand out money without seeing how it was spent in order to save a little in administration, but if this money which the taxpayer handed over to these various institutions was spent badly they might lose a great deal more than the cost of a few inspectors who went round to see that the money was properly expended. They were not up to their full establishment on the medical services; there were two vacancies, but he did not intend to fill them at the present time. There were also some six temporary appointments, the work of which had lapsed and which it was intended to discontinue for the present. There was also the possibility of the reduction of two more of the permanent established staff, making a total reduction on establishment and non-establishment of between nine and ten. That was as far as they could wisely go at the moment. The health-rate of the country was good. The birth-rate was rising and the death-rate declining. Infantile mortality showed a continued steady decline. The work at the maternity welfare centres with its concomitants, which would require development of pre-natal and post-natal care of mothers, was one of the most beneficent reforms any country could undertake. The number of health visitors had gone up from 1400 to 1700, the number of non-resident centres had risen from 1400 to 1900, the number of maternity homes from 740 to 1200, and the infant hospitals for children under 5 years from 50 to 367. He hoped that they would not economise on the infant life of the country.

Progress in Treatment of Tuberculosis.

They were making very good progress with tuberculosis. They could not build up perhaps in a day, and they might achieve relatively little at a time, but they could be confident that with all the difficulties and all the scepticism that one encountered, if they proceeded on sound lines of sanitation and on reasonable lines of care and treatment, if they proceeded on the lines of teaching people more about hygiene and how to avoid the disease, they could produce great improvement still in the physical, moral, and mental standard of our people. The venereal disease work so far as it had gone was making good progress. It was a very difficult but a very important piece of work. Although he did not believe in covering the country with nothing but posters drawing attention to this matter, and over-emphasising it, he was quite convinced that they must steadily proceed both with propaganda and with treatment. He was considering the issue of a new circular explaining the policy of the Department, which consisted in a sane and moderate view of this complex and difficult problem, which had a moral and a social as well as a medical side. Whilst he was prepared to assist in protecting the health of the nation against this dangerous illness he was not prepared to accede to the demands of those who seemed to regard the question with perfect sincerity and great enthusiasm merely from the medical aspect without taking the wider view. The appointment of some 33 medical referees whose duties were largely connected with the examination of members of Approved Societies for National Health Insurance had received a very considerable amount of criticism in the press. These appointments were really made as long ago as 1914 by that House. It was very difficult sometimes to determine whether a man was malingering, or whether he was fit to go back to his work. There was always a danger, he would not say of a bias on the part of his own medical attendant to give him the benefit of a doubt, but it was in the interests of the Approved Societies, of the State and the community, and really of the man himself, that he should go back to his normal life as quickly as possible. That was the work which the medical referees were largely occupied in doing. He had some doubt as to their utility when he came to his present office, and not being in the habit of merely accepting statements presented to him by other people, he went into the question himself. He asked over six medical referees in different parts of the country to come and see him, and he was very much impressed with the value of their work and with the way in which it was appreciated both by Approved Societies and the most intelligent of the ordinary general practitioners in the districts in which they worked. They acted also to a considerable extent as consultants, and were ready to act in that capacity to panel doctors when they had more than ordinary difficulty. He did not believe that their presence was resented by members of the general medical profession. They had not been acting very long, and they were only engaged as an experiment for a certain number of years; but as far as he could see at present they were doing good and useful work, and it would be a very great mistake under the pressure of clamour or prejudice now to do away with a very fruitful source of development of this work, by men very carefully chosen and very able, before anyone had had time to judge how far the work was really going to be of utility to the people. He believed that there was a great future before the Ministry of Health, which was only in its infancy. He hoped that one day research would be associated with the Ministry, for research was going to be one of the most fruitful of developments. He felt very greatly the responsibility of the position in which he was placed. There was a great work to be done, and if they could assist to put up a few small stones of the great building of national wealth and national health, and so endeavour to make disease a thing of the past, when illness will be a forgotten tradition and when people would wonder how they endured the present sanitary surroundings, the time spent would not be in vain.

Improvement of the Panel Service.

Sir WATSON CHEYNE asked what alteration, if any, was to be made in the medical services? He presumed that something would be done, because they knew that the panel service could be improved, and it would lie between improving it and introducing some new service—a form of State medical service. Personally he favoured finding out what the defects of the panel service were and trying to improve it rather than scrapping it and introducing a new service which certainly would not be at all favourable to the medical profession. Various things were required to bring the panel system more into the condition in which it ought to be. Much assistance was required in helping the medical men to diagnose their cases and also in regard to certain other matters. Various accusations had been made against panel doctors—chiefly of negligence, imperfect diagnosis, and so forth. His practice had been almost entirely in consultation with other doctors, and he had never come across any evidence of the kind in private practice. At the same time he could quite believe that it might be possible in a few cases that the statements might be more or less justified. When the Insurance Act was first under consideration he was always very doubtful about the question of medical benefit. He welcomed the idea of insuring against sickness, so as to provide money to tide over the sickness and so forth; but he very much questioned the advisability of the panel system as regarded the services of doctors. His belief was that the panel service could be very much improved in various ways. He believed that the one thing wanted to put things right was to increase the free choice of doctors. He wished to call attention to the question of research. He understood that the Medical Research Committee was ready to assist the Ministry of Health in any way it could. It was up to the Ministry to help any of their staff who wished to do research, and not to have to go to another body and ask leave. The existence of a proper research department was extremely necessary for the future of the Ministry. At present very little was being done. He mentioned these matters in the hope that the Minister would tell him that something was contemplated in that direction.

Mr. IRVING, a Socialist Member, protested against the Circular No. 185 issued by the Ministry containing the official declaration of policy in regard to maternity and child welfare. The circular, he said, was an attempt to save money, but if money could be saved along these pettifogging lines it would be quite infinitesimal, and the inevitable result would be that they would damage infant life and infant welfare. He objected to the provisions with regard to inquiries as to the necessity of families applying for milk for their children, or for expectant and nursing mothers. The inquisitorial methods adopted were too stringent.

Mr. STEWART raised the question of the insanitary conditions arising in connexion with caravan encampments, and urged that the Ministry should do more than they had done to safeguard the community against the possibilities of disease and epidemic from this source.

Too Much Economy.

Lieutenant-Colonel FREMANTLE said that what they had to aim at was a satisfactory blend between the attitude of those who limited themselves to their enthusiasms for public health, and of those who looked only at the side of economy. Zeal for economy had become a craze and had gone too far. It might result in the loss of a very large amount of life. He hoped that the Minister with his fresh eye and business-like mind would review not only the medical staff—as already he seemed to have done very thoroughly—but also the administrative staff at his office. He did not say that it was necessarily excessive, but when they saw a general clerical staff numbering 1593, including 477 assistant clerks, 301 women clerks, 276 writing assistants, with quite an unusual proportion of senior officers on the administrative side, one was bound to gain a certain impression, especially if one had experience of the local administration of public health. The only strong criticism against the Ministry was that there was too much red tape, too much letter writing, and too much clerical and filing work. There should be a checking committee in each office composed of members of the existing staff, whose duty it should be to decide the particular returns that were absolutely necessary. He could not understand the canard that was going round the press that the Ministry of Health inherited from the Local Government Board a staff of only four medical officers. During the 15 years that he was a county medical officer of health he had frequently to go to the Local Government Board, and he was aware of at least 15 different medical officers.

Dr. ADDISON (Minister without Portfolio): In 1918 there were 46—namely, 38 in the Local Government Board and 8 in the Insurance Department—not 4 as stated.—Lieutenant-Colonel FREMANTLE, continuing, said he agreed that the Medical Research Department of the Privy Council should be in touch with the Ministry of Health; if it was not it was a scandal. Although the improvement in vital statistics was due to a very large number of causes which they could not describe definitely as part of the health administration, there was no question that they were all centred round and stimulated, if not actually initiated and carried through, by the work of the whole organisation which had its pivot and centre in the Ministry of Health. The death-rate itself had been reduced very largely since the Ministry came into operation. It was about 13 or 14 per 1000 before the war and went up during the war to about 15 per 1000, and it had gone down in the last two years to 13·8 and 12·4, the figure for last year. Still more the infantile mortality figures must be very largely attributed to the work of the maternity and child welfare centres. The mortality had gone down to 80 per 1000.

Major FARQUHARSON said his candid opinion was that the housing notion had been overdone from the first. It was greatly due to a mixture of politics and sentiment. It was one of the most unfortunate positions that housing schemes should have been part of the work of the Ministry of Health. The medical staff of the Ministry doing expert scientific work, men of trained experience and sound education, many of whom had given their lives to the work, were getting collectively a sum rather less than one-third of what was being paid to this mushroom growth in connexion with housing. Instead of the medical staff being paid more money for 1921–22 it was actually getting less. Last year they were paid £106,907, and it was proposed to pay them this year £99,571. These 80 or 90 medical officers, who had recently been appointed to supervise and superintend the services rendered to something like 6,000,000 or 7,000,000 insured persons, had to bring themselves in liaison with something like 12,000 or 13,000 doctors. They had the spending of something like £9,000,000 per annum, and yet the paltry sum of something like £100.000 was being spent on the whole medical staff of the Ministry, while a sum of £300,000 was spent upon this excrescent mushroom growth in connexion with housing. He appealed to the Minister without portfolio not to cheese-pare in the direction of cutting down the medical staff of the Ministry. These men were very eminent men who had acquired a reputation in the profession before they entered the portals of the Ministry. If they compared the expenditure on research in this country with that of the continental nations it was perfectly ludicrous. He thought no line of public health offered a greater hope of magnificent and early results than infant welfare and maternity. As regards tuberculosis, the question was entirely an uncertain one. It was entirely experimental, and the whole question of sanatorium treatment had broken down. He appealed to the Minister to introduce a limit in this connexion. The most recent scientific inquiries went to show that in this country, at all events, it would be absolutely impossible to have a tubercular-free population. He believed that the trend of thought, experiment, and scientific inquiry was how far tuberculosis, instead of being the horrible scourge that many people regarded it, was in essence part of our equipment to withstand the severity of our climate.

Major MOLSON thought that the medical referees were very necessary for panel practice, and that the expenditure on them was very economical. He urged that much more should be spent on research.

The Minister's Reply.

Sir ALFRED MOND, replying to the debate, said that the new medical service of providing milk for expectant mothers and infants had been grossly misused. All that Circular 185 did was to require strict control of milk supplied to nursing and expectant mothers, and to place under medical supervision the distribution of this milk, which was given as a medicine. As regards the dangers arising from caravans, those vehicles at present numbered about 1100, of which 25 per cent. were occupied throughout the year. The Department had made two medical inspections of them during the past 10 years. But it was the duty of the local authorities to deal with this matter. All that the Ministry could do at present they were doing. There was no intention, except in the imagination of some people who seemed to belong to the psycho-analyst school and who discovered quite non-existent intentions in the minds of other people, of starting a vast system of State Medical Service. They were working on the lines of endeavouring to improve the panel system where it was capable of improvement, and steps were being taken in that direction. The panel had been lessened. There had been too many people on some panels. They were making improved regulations in regard to surgeries, bringing them in harmony with the best of the practitioners on the panel system. The system might be subject to criticism, but on the whole it had not worked so badly, and the medical profession had a great desire to do their best. He thought there was a good deal to be said for associating the Ministry with medical research in a more direct manner. The question of voluntary hospitals had been giving him very grave anxiety as well as to his predecessor. He expected the Cave Report towards the end of this month. He was extremely sorry that certain of the large hospitals had considered it necessary, in view of the fact that report of this committee was very closely impending, and that the Government were bound to take action on that Report speedily, to close these large numbers of beds, whereas perhaps in a few weeks' time the crisis might be past. He did not think anyone could reasonably ask him or the Cabinet to bring forward a scheme during the next few days. On the other hand, the Approved Societies had already set aside £250,000 to be paid during five years out of their surplus. He should have thought it would have been possible for the hospitals to have got their bankers to continue to advance the relatively small sum that might be necessary to carry them over the last few weeks. He still wondered whether something could not be done in that direction before final steps were taken. He hoped the directors of the hospitals would hold on a little longer until the Government had had an opportunity of studying the Cave Report and acting on it.

The vote was agreed to.

Accommodation at St. Dunstan's.

Mr. FREDERICK HALL asked the Minister of Pensions how many men blinded in the war had been refused admission to St. Dunstan's in the last two months, and whether, in view of the fact that the accommodation for blinded soldiers at St. Dunstan's was being seriously curtailed, the Government was making any provision for the training of these men in new occupations suitable to their condition.—Mr. IAN MACPHERSON replied: I am informed that accommodation at St. Dunstan's is being curtailed only because the requirements are diminishing, and that no man whose blindness is due to his war service has been refused admission.

Treatment of Bilharziasis.

Mr. GRATTAN DOYLE asked the Minister of Pensions if he was aware that Dr. Christopherson's antimony treatment was now accepted as a certain cure for bilharziasis; that the Australian Government, after segregating all returned soldiers infected in Egypt, had completely stamped it out by this method of treatment; that there were still a number of men in this country who were infected during the South African war, and were still sufferers, but who were debarred from treatment by the Ministry because they had not served, in many cases because of this disease, in the recent war; and if there was any valid reason why these men should not have an exception made in their particular favour and receive treatment.—Mr. IAN MACPHERSON replied: I am fully in sympathy with my honourable friend's suggestion, concerning which I am in communication with my right honourable friend the Secretary of State for War.

Liquor Control.

Replying to questions by Sir J. BUTCHER, Mr. LLOYD GEORGE (Prime Minister) stated that the Government had decided that the Liquor Control Board should be placed under the Parliamentary control of the Parliamentary Under Secretary to the Home Office (Sir J. Baird) who would be chairman.

Opium Traffic Advisory Committee.

Mr. GILBERT asked the Lord President of the Council whether he would give the names of the international advisory committee appointed by the Council of the League of Nations to advise on the execution of the agreements in regard to the traffic in opium and other dangerous drugs, and also the names and qualifications of the three medical and technical experts appointed to assist the committee.—Mr. BALFOUR replied: The composition of the Advisory Committee on the Traffic in Opium is as follows:—

Representatives of Governments.—Monsieur W. G. Van Wettum, ex-Director of the Opium Traffic Service in Dutch Indies (Netherlands); Sir Malcolm Delevingne, of Home Office (Great Britain); Monsieur Kahn, formerly French Minister in Siam (France); Mr. J. Campbell, of India Office (India); His Excellency A. Ariyoshi, Japanese Minister at Berne (Japan); His Excellency Tang Tsai-Fou, Chinese Minister at Rome (China); His Excellency Prince Charoon, Siamese Minister at Paris (Siam); His Excellency Bartholomeu Ferreira, Portuguese Minister at Berne (Portugal).

Assessors.—Sir John Jordan, formerly British Minister at Peking; Monsieur Brenier, French Delegate to the International Opium Conference at The Hague in 1912, and at present Director-General of the Services of the Chamber of Commerce at Marseilles; Mrs. Hamilton Wright, widow of Dr. Hamilton Wright, American Delegate to the International Opium Conference at The Hague.

Sir J. D. REES: When the Council of the League of Nations has received this advice, and, if it accepts the advice, will it then become binding upon anybody; and, if so, upon whom?—Mr. BALFOUR: What will happen if and when the advice is accepted will be a matter for the consideration of the Council.

Arsenobenzol Treatment of Venereal Diseases.

Mr. ROBERT RICHARDSON asked the Minister of Health if he would grant a return of all the cases of death arising from ill-effects of the arsenobenzol treatment of venereal diseases which had been reported to his department since the commencement of the public treatment of these diseases; and if in future he would arrange for such particulars to be recorded in his annual report, or in that of his chief medical officer.—Sir ALFRED MOND replied: Twenty-one deaths have been reported to my department as following the administration of arsenobenzol compounds in treatment centres of venereal diseases. Further inquiries show that in three of these cases death was not due to the administration of the drug, and that in five other cases it was doubtful how far the drug had contributed to the fatal result. In the last complete year for which figures are available the number of deaths in which the administration of the drug may have been a contributing cause represents 1 in approximately every 4300 patients treated for syphilis, and 1 in approximately 30,000 injections of these drugs. I will consider the suggestion in the last part of the question.

Lock-up Medical Practices.

Mr. GRATTAN DOYLE asked the Minister of Health whether his attention had been drawn to the increasing numbers of what were known as lock-up medical practices, where panel medical practitioners saw panel patients at fixed hours only, as they (the doctors) only had consulting-rooms there, while they resided it might be miles away, out of reach of a panel patient in an emergency; and whether, in view of the hardship thereby incurred by the patient, he would consider the taking of necessary action in this matter of urgent public interest.—Sir ALFRED MOND replied: My attention has been drawn to one or two cases of the kind referred to in the question which are under investigation. If my honourable friend is aware of any case of the kind I should be obliged if he would furnish me with particulars, as the regulations make adequate provision for dealing with such cases.

Public Health (Tuberculosis) Bill.

The House considered the Lords Amendments to the Public Health (Tuberculosis) Bill.—Sir ALFRED MOND explained that the only amendment of any real substance was a new Clause with respect to the institutional treatment of seamen. He was glad to say that they had come to a satisfactory arrangement which would be of great benefit to the seamen of this country in the future. The amendments were agreed to.

Supplies of Petrol.

Mr. CLOUGH asked the Minister of Transport what supplies of petrol existed in this country; and whether they were adequate for all the immediate needs of the country, assuming that due care in use was taken.—Sir P. LLOYD-GREAME (Parliamentary Secretary to the Board of Trade) replied: The supplies of petrol in this country are at present unusually high. The answer to the second part of the question is in the affirmative.

Protection of Women and Young Persons Bill.

Mr. WIGNALL introduced a Bill "to make further provision for the protection of women and of young persons of both sexes from sexual immorality, and from conduct akin thereto, or connected therewith, and with respect to prostitution and brothels, and to amend Sections 58 and 59 of the Children Act, 1908." The measure was read a first time.

FRIDAY, MAY 13TH.

Inoculation Laboratories at Beckenham.

Mr. HOOD asked the Minister of Health whether he was aware that a private firm proposed to use Langley Court, Beckenham, as laboratories for the purpose of the cultivation of germs and the inoculation of horses and other animals in order to make diphtheria and other serum; whether over 60 animals had already been assembled on the premises for the purpose; whether these operations would constitute a danger to the inhabitants of the district; and what action he proposed to take in the matter.—Sir ALFRED MOND replied: I am aware of this case. A local inquiry has been held by one of my inspectors and his report is now under my consideration.

Bastardy Bill.

The Bastardy Bill was read a second time and committed to a Standing Committee.

BOOKS, ETC., RECEIVED.

ALLAN, PHILIP, AND CO., London.
The Purple Sapphire and other Posthumous Papers Selected from the Unofficial Records of the University of Cosmopoli. By C. Blayre, sometime Registrar of the University. Pp. 210.

ALLEN, GEORGE, AND UNWIN, London.
An Introduction to the Psychological Problems of Industry. By F. Watts, M.A. Pp. 240. 12*s.* 6*d.*

ARNOLD, EDWARD, London.
A Guide to Diseases of the Nose and Throat and their Treatment. By C. A. Parker, F.R.C.S. Edin., and L. Colledge, M.B., F.R.C.S. Pp. 583. 25*s.*

BALE, JOHN, SONS, AND DANIELSSON, London.
Letters to a Nurse by a Midland Doctor. Pp. 99. 5*s.*

HARVARD UNIVERSITY PRESS, Cambridge, Mass.
Typhus Fever, with Particular Reference to the Serbian Epidemic. By R. P. Strong, M.D., and Others. Pp. 273.

HIRSCHWALD, AUGUST, Berlin.
Grundriss der Augenheilkunde. Von Dr. C. H. May und Dr. E. H. Oppenheimer. Zweite von Dr. Oppenheimer völlig umgearbeitete deutsche Auflage. Pp. 427. M. 60.

LOTHIAN BOOK PUBLISHING CO., Melbourne and Sydney.
The Diary of an Australian Soldier (Captain K. J. Barrett). Pp. iii. + xxiii. 7*s.* 6*d.*

MACMILLAN AND CO., London.
Human Physiology. By Prof. Luigi Luciani, with preface by Prof. J. N. Langley, F.R.S. Vol. V., edited by Prof. M. S. Pembrey (Metabolism, Temperature, Reproduction, &c.). Pp. 422. 30*s.*

MALOINE, A., ET FILS, Paris.
La Blennorragie son Evolution. By M. Bordier. Pp. 192.

MASSON ET CIE, Paris.
De l'Anaphylaxie à l'Immunité. Anaphylaxie—Protéotoxies, Envenimations, Anaphylaxie-Immunité, Sérums Antivenimeux. Par Prof. Maurice Arthus. Pp. 361. Fr. 20.

MILFORD, HUMPHREY (OXFORD UNIVERSITY PRESS), London.
Studies in the History and Method of Science. Edited by Charles Singer. Vol. II. Pp. 559.
Counsels and Ideals from the Writings of William Osler. Selected and edited by C. N. B. Camac. With Extracts from Articles appearing since 1904. 2nd ed. Pp. 355. 8*s.* 6*d.*

OLIVER AND BOYD, London and Edinburgh.
University of Edinburgh Roll of Honour, 1914-1919. Pp. 785. 40*s.*

PITMAN, Sir ISAAC, AND SONS, London.
Drugs in Commerce. By J. Humphrey, Ph.C., F.J.I. Pp. 116. 3*s.*

PUTNAM'S, G. P., SONS, London and New York.
Teeth and Health. By T. J. Ryan, D.D.S., and E. F. Bowers, M.D. Pp. 264. 7*s.* 6*d.*

ROUTLEDGE, GEORGE, AND SONS, London.
A Handbook of Laboratory Glass Blowing. By Bernard D. Bolas. Pp. 156. 3*s.* 6*d.*

THIEME, GEORG, Leipzig.
Die Bedeutung der verschiedenartigen Strahlen für die Diagnose und Behandlung der Tuberkulose. Von Dr. R. Gassul. Pp. 72.

UNIVERSITY OF CALIFORNIA, DEPARTMENT OF RESEARCH MEDICINE.
Collected Reprints from the George Williams Hooper Foundation. Pp. 282.

UNIVERSITY OF LONDON PRESS, London.
Intrinsic Cancer of the Larynx and the Operation of Laryngo-Fissure. By I. Moore, M.B., C.M. Edin. Pp. 147. 20*s.*
Psychanalysis in the Class-room. By George H. Green, B.Sc., B.Litt. Pp. 276. 7*s.* 6*d.*
The Education of Behaviour. By I. B. Saxby, D.Sc. Pp. 248. 6*s.*

UNWIN, T. FISHER, LTD., London.
The Diary of a Yeomanry M.O. By Captain O. Teichman, R.A.M.C., T.F. Pp. 283. 12*s.* 6*d.*
Eminent Chemists of Our Time. By B. Harrow, Ph.D. Pp. 248. 9*s.*

WATTS AND CO., London.
Nature's Way: A Means of Health without Medicine. By R. Mallett. Pp. 45. 1*s.*

WRIGHT, JOHN, AND SONS, Bristol. SIMPKIN, MARSHALL AND CO., London. The Medical Annual, 1921. Pp. 616. 10*s.*

Medical News.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—Three public lectures on the History of Chemistry in the Nineteenth Century will be delivered by Sir William Tilden, F.R.S., in the Chemistry Theatre of the College, on Friday, May 27th, June 3rd and 10th, at 5 P.M.

UNIVERSITY OF MANCHESTER.—**The following appointments have been made:** Dr. Albert Ramsbottom as Professor of Clinical Medicine. Dr. Ramsbottom is physician to the Manchester Royal Infirmary and lecturer on clinical medicine in the Victoria University. Lecturer in Histology, Miss Ruth Fairbairn; Assistant Lecturers in Physics, Mr. J. C. M. Brentano and Mr. H. Lowery.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An extraordinary Comitia of the Royal College of Physicians of London was held on May 12th, the President, Sir Norman Moore, occupying the chair, when the following gentlemen, elected to the Fellowship at the last meeting, were formally admitted as Fellows:—Dr. C. O. Hawthorne, Dr. C. H. Melland, Dr. J. G. Emanuel, Dr. A. E. Barnes, Dr. J. P. Hedley, Dr. J. A. Torrens, Dr. A. J. Clark, Dr. A. Feiling, Dr. R. H. Steen, Dr. C. M. Wilson, and Dr. G. E. S. Ward.—The Committee of Management reported having received from Sir Charles Ballance, the visitor appointed by the Royal Colleges to inspect the examinations, a full and interesting report on the examinations of the Egyptian Medical School and Hospital at Cairo, and on the teaching at the school and hospital. The Committee expressed the opinion that the examinations and course of education justified the Royal Colleges in continuing their recognition of the school.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At a meeting of Comitia of the Royal College of Physicians on April 28th and of the Council of the Royal College of Surgeons on May 12th Diplomas in Public Health were conferred, conjointly, upon the following candidates:—

G. J. Bowen, Middlesex; I. G. de Zilva, Madras and Roy. Inst. Public Health; A. W. F. Edmunds, King's College; J. J. Gasperine, St. Bart.'s and Roy. Inst. Public Health; M. Gross, Westminster and Roy. Inst. Public Health; A. C. Hancock, Guy's and Univ. Coll.; R. H. Liscombe, J. B. Low, and J. J. MacDonnell, Univ. Coll.; E. F. W. Mackenzie, Edinburgh and Royal Army Med. Coll.; Gladys M. Miall-Smith, Royal Free and Univ. Coll.; A. H. Patel, Bombay and Roy. Inst. Public Health; A. J. Patterson, Dublin and Haslar; G. H. Pearson, London and King's Coll.; A. L. H. Rackham, Middlesex; B. K. Ray, Calcutta and Univ. Coll.; A. C. Renwick, Edinburgh and King's Coll.; P. C. Sen, Calcutta and King's Coll.; R. J. L. Sladen, Univ. Coll.; M. Subramanyam, Bombay and King's Coll.; R. Swyer, Univ. Coll.; W. B. B. Taylor, London and Royal Army Med. Coll.; and H. J. Thomas, Univ. Coll.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At recent examinations of the Board the following candidates completed the examination, and were admitted Diplomates in Public Health:—

Thomas Pullar and Janet Bisland Higgins.

The following candidates passed in Part I.:—

Ellen D. Anderson, William Cunningham, Robert J. Peters, Andrew Davidson, Mary C. Walker, Marguerite Linck Sclanders, William H. Wallace, William D. MacKinnon, Edward M. E. Cumming, Andrew M. Davidson, Campbell L. Miller, David Heard, David Fyfe, William McKendrick, Helena E. Barrett, Samuel J. Henderson, and John Frew.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.—The annual provincial meeting of this Society will be held on Saturday, June 11th. Members will assemble at the house of the Society at 10.30 A.M. and proceed by motor coach to Hatfield House, which will be visited by invitation of Lord Salisbury. Afterwards the party will go on to Welwyn Garden City, where they will be entertained at luncheon by the President of the Society, Lieutenant-Colonel F. E. Fremantle, M.P. The afternoon will be spent in viewing the Welwyn housing and town-planning schemes until 4 P.M., when Mrs. Fremantle has invited members to tea at Bedwell Park. As it is necessary to make early arrangements for motor coaches, members who intend to be present should give prompt notice to the Executive Secretary, 1, Upper Montague-street, Russell-square, W.C. 1, stating if they will be accompanied by ladies. A remittance of 10*s.* 6*d.* for each motor coach ticket should be forwarded with the application.

MEDICAL SOCIETY OF LONDON.—**On Monday,** May 23rd, at 8 P.M., the annual general meeting will be held. At 9 P.M. the annual oration will be delivered by Lord Dawson, of Penn, K.C.V.O., on the Colon and Colitis.

MEDICO-LEGAL SOCIETY.—**A meeting of this Society** will be held at 11, Chandos-street, London, W., on Tuesday, May 24th, at 8.30 P.M., when a paper will be read by Mr. W. G. H. Cook on the Liability of the Insane in Respect of Civil Wrongs.

LONDON HOSPITAL MEDICAL COLLEGE: *Surgical Unit.*—A special course of ten lectures on Advanced Surgery will be given on Tuesdays and Thursdays, at 4.15 P.M., in the Unit Lecture Theatre of the hospital, beginning on June 7th, when Mr. Russell Howard will give the first of two lectures on Diseases of the Breast. Subsequent lectures will be announced in our Medical Diary. Post-graduates and senior students are invited to attend.

AN International Congress on the History of Medicine will be held at Paris on July 5th, and will be presided over by Professor E. Jeanselme and Professor W. Menetrier. There will be lectures, discussions, and excursions. All who possess documents or instruments of interest are invited to lend them to the organisers for temporary exhibition.

SUMMER POST-GRADUATE MEDICAL COURSES.—*University of Paris.*—A vacation post-graduate course will be held during July at the Clinique Médicale de l'Hôtel-Dieu under the auspices of the Faculty of Medicine. The course will deal with recent additions to our knowledge of clinical practice and the application of current laboratory methods of diagnosis. It will begin on Monday, July 4th, and will be under the direction of Professor (agrégé) Maurice Villaret, with the collaboration of Mr. Herscher, Mr. E. Guilleminot, Mr. Lippmann, Mr. Jomier, Mr. Chabrol, Mr. Brin, Mr. Henri Bénard, Mr. Dufourmentel, Mr. F. Saint-Girons, Mr. Coury, Mr. Paul Descomps, Mr. Dumont, Mr. E. Deval, Mr. H. Dausset, Mr. L. Durey, Mr. Gérard, Mr. Lagarenne, and Mr. Comandon. A week's trip to spas in the Pyrenees will be arranged, starting on July 9th, and the studies in Paris will be resumed on July 18th. Details and programme of this trip may be obtained from M. le Dr. Dausset, Clinique médicale de l'Hôtel-Dieu, Paris. A certificate will be issued to those who have taken part in the course, for which the fee is Fr.150.

St. Bartholomew's Hospital and College.—A course of instruction for qualified practitioners will be given during the summer vacation, beginning on Monday, July 18th, and ending on Saturday, July 30th, with the object of affording practitioners the opportunity of attending the practice of a large metropolitan hospital and medical school for a short period, and of receiving systematic teaching from members of the hospital staff at a time when ordinary lectures and classes are mainly in abeyance and comparatively few students are in attendance. By payment of a composition fee of £8 8*s.*, a practitioner will be entitled to attend, between the dates given above, any of the special classes, except clinical pathology and bacteriology, and the ordinary hospital practice, including wards, out-patients, special departments, operations and post mortems. Practitioners who are perpetual students of St. Bartholomew's Hospital will be admitted to the post-graduate classes, except clinical pathology and bacteriology, on payment of a fee of £6 6*s.* An extra fee of £2 2*s.* will be payable by any practitioner who attends the class in clinical pathology and bacteriology. Fees are due in advance, and cheques should be made payable to the Dean, Dr. T. W. Shore.

Glasgow Post-Graduate Medical Association.—A comprehensive course of instruction has been arranged for medical practitioners, extending from May till October, 1921. Most of the hospitals in Glasgow are taking part in the scheme, and the classes, as far as possible, have been arranged so that a practitioner who so desires may be enabled to occupy the greater part of each day attending classes. The classes are open to all qualified medical practitioners, and will be conducted independently of the undergraduate courses. A practitioner may enrol for one or several classes, and may attend for one or more months as desired. The classes are specially designed to suit the requirements of general practitioners, but in order to meet the needs of graduates and others who wish to obtain a closer acquaintance with hospital work arrangements have been made whereby a limited number may become attached to wards or out-patient departments, nominally as clinical assistants, for definite periods throughout the year. Intending students must enrol and pay their fees at the institutions in which the particular classes are held. Further information will be supplied on application to Dr. A. M. Kennedy, secretary, Post-Graduate Medical Association, University, Glasgow.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee, held on May 10th, 21 cases were considered, and £308 voted. The following is a summary of the cases relieved:—

Daughter, aged 54, of M.R.C.S. Eng. who practised in Liverpool and died in 1872. Applicant had a stroke suddenly in April, 1920, which affected her left side, and was taken to Charing Cross Hospital, where she remained for four or five months; considered incurable was sent to a nursing home and the fees are being paid by three sisters whose incomes are extremely limited; she also receives £8 15s. from an uncle. Prior to her illness applicant acted as a companion and also taught music, French, and German. Her sister, aged 53, also is suffering from paralysis and is in a nursing home, she also has applied for help from the Fund. Voted £18 in 12 instalments.

Daughter, aged 73, of M.R.C.S. Eng. who practised in the R.A.M.C., and was also a Resident Medical Officer in London later, and died in 1891. Owing to a limited income and having to help towards the expenses of a bedridden brother in a nursing home applicant has asked the Fund to help her to supplement her Grice Annuity of £40 and the £4 she was paid for making fancy bags and painting little water-colour sketches. Since the war have had to pawn family things and have to pay a heavy rate of interest. Her sister applied to the Fund, and the Committee made her a grant of £10. Voted £10.

Widow, aged 25, of M.R.C.S. Eng., 1914, who acted as locum, and in 1918 he was attached to the Russian Red Cross Society and died of typhus while working on a Red Cross train in 1920. Applicant managed to escape from Russia with her little son, aged 4, and arrived in England without means and is at present being supported by friends. She is very anxious to be self-supporting, and to this end has applied to the Fund for help and to advise in placing her son in a school. Voted £10.

Widow, aged 55, of L.F.P.S. Glasg. who practised in Liverpool and was acting as surgeon on board when torpedoed and all were lost. Applicant receives a pension from the War Risk Association of £5 6s. 8d. per month. Rent 11s. per week. Her youngest son, who is in the Merchant Service, is now unfortunately out of work, and applicant finds it difficult to support two on her small pension. Voted £10 in two instalments.

Widow, aged 80, of L.R.C.S. Irel., L.R.C.P. Edin. who practised at Benfleet and died in 1918. Her sole income consists of £50 per annum derived from insurance. Applicant asks for help to supplement this amount, as her rent is £10 and her board costs 15s. per week. Voted £18 in 12 instalments and also £6.

Widow, aged 55, of L.S.A. Lond. who acted as locum and died in 1921. Owing to illness applicant's late husband was helped by the Fund, and now his widow asks for help, as she has no settled income and lets two unfurnished rooms to help to pay her way. She receives from friends about £26 per annum and 7s. 6d. for her rooms, and her rent is 17s. 6d. per week. Voted £10 in two instalments.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters J. Symonds, K.B.E., C.B., F.R.C.S., at 11, Chandos-street, Cavendish-square, London, W.1.

SCOTTISH CONSULTATIVE COUNCIL AND THE MEDICAL GUILD.—Our Scottish correspondent writes: Criticism of the scheme of medical service for Scotland, presented last January to the Scottish Board of Health by the Consultative Council on Medical and Allied Services, was, as your readers already know, widespread. The Medical Guild took the opportunity of obtaining the views of the medical profession in Scotland on certain specific points. Two questions were submitted in the form of a referendum. One of these asked for approval or otherwise of the attitude of the Guild expressed thus: "Matters will be righted only when the State ceases to interfere with medical attendance on sick people other than those who belong to the necessitous classes, so long as the sick are not a danger to the community by reason of infectivity." The other ran: Do you approve of the proposed extension of National Health Insurance (Recommendation 4)? Replies favourable to the policy of the Guild required "Yes" for Question 1 and "No" for Question 2. The returns so far to hand number 1331, and are summarised by the Guild as follows: Of that number 1105, or approximately 83 per cent., voted "Yes" to Question 1 and "No" to Question 2; 165, or approximately 12½ per cent., answered both questions in the negative; the remaining 61, less than 5 per cent., voted "No" for Question 1 and "Yes" for Question 2, and thus this small minority only were in favour of the recommendations of the Consultative Council. The large majority, 1270—i.e., 1105 plus 165, over 95 per cent. of the total vote, were therefore opposed to further extension of the National Health Insurance Act, which is made the basis of the Consultative Council's scheme. In many cases replies were accompanied by emphatic protests against the nationalisation of the practice of medicine, notably from men who have had ample experience of work under a State medical service similar in outline to the scheme proposed by the Consultative Council. The statement of the Guild concludes: "It is difficult to give an accurate statement of the number of men at present serving under the National Insurance Act who voted with the above large majority, but the returns received from certain working-class districts prove that the proportion was large. The result of this referendum demonstrates that a large section of the profession in Scotland is opposed to the provision for medical services recommended in the Interim Report, including the extension of the National Health Insurance Act."

LONDON DERMATOLOGICAL SOCIETY.—A meeting of this Society will be held at 4.30 P.M. on Tuesday, May 24th, at St. John's Hospital, 49, Leicester-square, London, W.C., when clinical cases will be shown.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The next quarterly meeting will take place on Tuesday, June 7th, at the Maudsley Hospital, Denmark Hill, S.E., under the presidency of Dr. W. F. Menzies, at 3 P.M. Sir Frederick Mott will deliver the second Maudsley Lecture at 4.30 P.M.

OPHTHALMOLOGY IN RELATION TO OCCUPATION.—A course of extension lectures on Ophthalmology in Relation to Trades and Occupations has been arranged in connexion with the Post-Graduate School of the Royal London (Moorfields) Ophthalmic Hospital to be given at the Royal Society of Medicine at 5.30 P.M. Monday, Tuesday, and Wednesday, May 23rd to 25th, Illumination, by Mr. J. Herbert Parsons, F.R.S.; Thursday, May 26th, Practical Illumination, by Mr. L. Gaster, secretary of the Illuminating Engineering Society; Monday, May 30th, Miners' Nystagmus, by Dr. Lister Llewellyn; Tuesday, May 31st, Injuries due to Penetrating Foreign Bodies, by Mr. Charles Goulden, F.R.C.S.

AT this year's annual dinner of the Leeds Caledonian Society, Dr. Wardrop Griffith, the President, in the name of the Society, handed to the treasurer of the infirmary a cheque for £1200 and held out hopes of the sum being increased to £1500. This would enable three cots to be endowed in the name of the Society in the new department of the infirmary. It is hoped that this example may be followed by others.

CARE OF SICK CHILDREN IN LEEDS.—From time to time philanthropic persons in Leeds make their voices heard in the plaint that there is "no hospital for children." There is now no separate building called a Children's Hospital, but Leeds has a Children's Hospital within the walls of the General Infirmary. In connexion with the increase in the number of beds, which has been secured by the completion of the King Edward Memorial Extension, the board of this infirmary has had under consideration plans for increasing the accommodation for children and for the segregation of young patients in one department. Wards 6, 8, and 10, all of which are on the level of and communicate directly with the North Terrace, are to be allotted to the children's department. They are to be connected by bridges at their further end so as to ensure the safety of the children in the event of fire, as well as to provide open-air accommodation for patients. Certain alterations and extensions on the terrace will provide a semi-open-air ward with accommodation possibly for 20 patients. It is hoped that in the near future there will be about 120 cots in all. Of the three wards one is to be allotted to medical cases, one to surgical cases, and the third is to have 19 surgical, 8 ophthalmic, and 6 aural cases; the allocation of the 20 beds on the terrace has not as yet been considered. It is apparently the belief in well-informed medical circles in Leeds that the best way to improve the accommodation for children under prevailing conditions is not to try to create a separate institution, but to extend and improve the accommodation at the central institution, and at the same time to increase the already existing accommodation at the semi-convalescent hospitals. Provision must be made for the prolonged treatment both of surgical cases and of certain forms of medical tuberculosis. A source of strength to the Leeds Medical School and to its charitable institutions is the prevailing system of centralisation; and in the best interests of the public, the patients, and the medical school alike it is to be hoped that this will be maintained. A new development in the children's department from which good results may ensue is the rearrangement of the allocation of beds. For some time there has been an out-patient department for the nutritional diseases of children under the age of three years, controlled by one of the assistant physicians, but all children admitted to the wards have come under the charge of one of the full staff. In the future a member of the assistant staff will have two out-patient days, one for the nutritional diseases of young children and the other for children suffering from medical ailments. To him are allotted all the beds allocated to the nutritional diseases of children, and one-fourth of the remaining medical children's beds, while the remaining three-fourths of the medical children's beds are divided between the three members of the full staff. This department of the infirmary has been linked up under Dr. C. W. Vining's direction with one of the centres of the babies' welcome organisation, and thus students are getting valuable experience in a branch of practical study not as yet on the curriculum of most medical schools.

THE MORRISTOWN PHYSIATRIC INSTITUTE.—The Physiatric Institute, Morristown, New Jersey, U.S.A., has been established for the treatment of metabolic disorders, especially diabetes, obesity, Bright's disease, and high blood pressure. The purposes of the Institute are scientific and philanthropic, and treatment is offered to suitable patients whatever may be their financial circumstances. Morristown is situated about 6000 ft. above sea-level; the district is noted for its beauty and climate, the latter being healthy and agreeable all the year round. There is an excellent train service to New York City by the Delaware and Lackawanna Railroad. The site of the Institute is a former large private estate comprising about 200 acres of woodland, lawns, gardens, and farmland. The main building, standing at the highest point of the property, commands views of great charm. A private lake, an 18-hole golf course, tennis and squash-rackets courts, &c., are included in the grounds. The diet kitchen and laboratories are completely equipped and organised for study of each individual case; patients are expected to cooperate seriously in their treatment, and to adhere rigidly to the rules laid down for them.

For well-to-do patients the Institute is said to offer the advantages of a private sanatorium; "worthy" poor patients are received on proper recommendation, and can obtain treatment at lower rates or free, or when able may perform some kind of work for part payment. Scientific research is one of the main aims of the Institute; over 500,000 persons in the United States to-day have diabetes, and the numbers of those suffering from arterio-sclerosis, kidney disease, and high blood pressure are much greater. The principal appeal for funds, which are urgently needed to support and extend both the scientific and philanthropic sides of the work, is made to the patients themselves and to their relatives and friends.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

BATTEN, H. E., F.R.C.S., has been appointed Head of the Department of Orthopædics, including Remedial Exercises and Massage, at Charing Cross Hospital.

COATES, V. M., M.R.C.S., L.R.C.P. Lond., Honorary Assistant Physician to the Royal United Hospital, Bath.

FIRMAN-EDWARDS, L., M.B., B.Ch. Cantab., Honorary Pathologist to the Royal Isle of Wight County Hospital, Ryde.

WEBSTER, J. H. D., M.D. Edin., Honorary Physician-in-charge of the Department of Physical Medicine at the Middlesex Hospital.

WHITEHOUSE, B., M.S. Lond., F.R.C.S. Eng., Honorary Obstetric Officer to General Hospital, Birmingham.

Paddington Green Children's Hospital: MORRIS, J. C., M.B., Ch.B. Edin., House Physician; BRUNTON, W. D., M.B., Ch.B. Edin., House Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: FAULKNER, C. D., M.R.C.S., L.R.C.P. Lond. (Stanford-le-Hope); PENHALE, W. P., M.R.C.S., L.R.C.P. Lond. (West Bromwich).

Vacancies.

For further information refer to the advertisement columns.

Adelaide University.—Professor of Zoology. £1100.
Barrow-in-Furness County Borough.—Asst. Sch. M.O. £500.
Bedford County Hospital.—Asst. H.S. £150.
Birmingham, Queen's Hospital.—Hon. Obst. O.
Bootle Borough Hospital.—H.S. £150.
Bury St. Edmunds, West Suffolk General Hospital.—Res. H.S. £200.
Cardiff City and Port Education Authority.—M.O.H. and Chief M.O. £1200.
Chester Royal Infirmary.—Asst. H.S. £175.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—H.P. £125.
Dumfries, Crichton Royal Mental Hospital.—Clin. Path. £400.
Dundee Royal Infirmary.—Hon. Asst. Gynæcol. and Obstet. Dept.
Durham, County Sanatorium, Holywood Hall, Wolsingham.—Asst. M.O. £400.
East Sussex County Council Education Committee.—Asst. Sch. M.O. £500.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—Female Asst. P., Asst. Radiologist, H.P., Obstet. Asst., and H.S.'s. Each £50.
Hellingly, East Sussex County Mental Hospital.—Sec. Asst. M.O. £450.
Hospital for Sick Children, Great Ormond-street, W.C.—Clin. Asst. in Venereal Dept. £1 1s. per visit. H.S. £100.
Hull Royal Infirmary.—Asst. H.S. £150.
Hull and Sculcoates Dispensary.—M.O. £450.
Infants Hospital, Vincent-square, Westminster.—Female Res. M.O. £200.
Kensington and Fulham General Hospital, Earl's Court, S.W.—H.S. £100.
Leeds Dental Hospital.—Hon. Asst. Dent. S.
London County Council.—Seventh Asst. M.O. £300.
London Temperance Hospital, Hampstead-road, N.W.—Ophth. S. and Asst. S. Also Res. Cas. O. £125.
Maidstone, West Kent General Hospital.—H.S. £220.
Manchester County Asylum, Prestwich.—Asst. M.O. £572 18s.
Manchester, University of, Department of Pathology.—Lecturers in Morbid Anatomy and Morbid Histology, Bacteriology, and Chemical Pathology. £700 each.
Manchester, Whitworth Park Hospital.—H.S. £100.
Middlesbrough Education Committee.—Female Asst. School M.O. £500.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. Asst. P.
Norwich, Norfolk and Norwich Hospital.—H.P. £200.
Nottingham City Education Committee.—Jun. Asst. Sch. M.O. £537 10s.
Oldham Royal Infirmary.—H.S.'s. £250 each.
Orkney, Eday Parish Council.—M.O. £5 per week.
Prince of Wales's General Hospital, Tottenham, N.—Hon. P. and Hon. Asst. P.
Queen Mary's Hospital for East End, Stratford, E.—Cas. O.
Rotherham Hospital.—Jun. H.S. £150.
Royal Naval Medical Service.—Surg.-Lieuts. 26s. 6d. per diem.
Royal South Hants and Southampton Hospital.—Sen. H.S. £200. Also H.P. £150.
Southampton Free Eye Hospital.—H.S. £200.
South London Hospital for Women, South Side, Clapham Common, S.W.—Temp. (Female) Asst. S.
South Shields County Borough.—Ven. Dis. M.O. £750.
Staffordshire General Infirmary.—H.S. £250.
Sunderland Royal Infirmary.—H.S. £200.
Swansea County Borough.—Asst. M.O. £500.
Taunton and Somerset Hospital.—Sen. and Jun. H.S.'s. £200 and £150.
University College Hospital.—Part-time Anæsth. £150.
Wandsworth Union, St. John's Hill Hospital.—Locum Tenens M.O. £8 8s. per week.
Winchester, Royal Hampshire County Hospital.—Sec. Res. M.O. £150.
York County Hospital.—Third Res. O. £150.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Clwt-y-Bont (Carnarvon), and at Washington (Durham).

Births, Marriages, and Deaths.

BIRTHS.

ATTWOOD.—On May 15th, at Glenfern, The Avenue, Southampton, the wife of Dr. H. C. Attwood, of a son.

LYNHAM.—On May 10th, at The Chine, Grange Park, N., the wife of Dr. J. E. A. Lynham, of a daughter.

MOORE.—On May 10th, in a nursing home, Chester, the wife of L. C. Moore, M.R.C.S., L.R.C.P., of a son.

NEVE.—On May 8th, at Barnhill, Bromley, Kent, the wife of Dr. Ernest F. Neve, of a daughter (stillborn).

SHELDON.—On May 13th, at Chepstow Villas, W., the wife of W. Sirr Sheldon, M.R.C.S. Eng., L.R.C.P. Lond., of a son.

MARRIAGES.

HICKINBOTHAM—GODFREY.—On May 10th, at St. Margaret's Church, Lee, S.E., James Ryland Hickinbotham, M.B., to Mary Irene Godfrey.

DEATHS.

KEAY.—On May 9th, at Bodmin, Cornwall, after a long and painful illness, Charles Henry Keay, M.B., B.S., L.R.C.P., M.R.C.S., aged 29 years.

MACDONALD.—On May 8th, at The Haven, Inverness, Thomas Rankin Macdonald, M.B., F.R.C.S.E., late Lieutenant-Colonel, I.M.S.

MICHIE.—On May 11th, suddenly, Dr. William Adam Michie, at 15A, Gower-street, W.C., aged 69.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages and Deaths.

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SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, May 31st.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for Election to the Fellowship. (Names already circulated.)

MEETINGS OF SECTIONS.

Monday, May 23rd.

SECTION OF ODONTOLOGY: at 8 P.M.
Annual General Meeting—Election of Officers and Council.
Casual Communication: Mr. J. Howard Mummery and Mr. G. J. Harborow: A Composite Odontome.
Paper: Mr. A. T. Pitts: The Prophylactic Extraction of the Third Molars.

Tuesday, May 24th.

SECTION OF MEDICINE: at 5.30 P.M.
Annual General Meeting.—Election of Officers and Council.
Discussion: On "Artificial Pneumothorax," to be opened by Dr. Clive Riviere. The following will also take part:—Dr. S. Vere Pearson, Dr. Neville Cox, Dr. Donald Hall, Dr. Jane Walker, and Dr. C. S. Burrell.
Will other Members wishing to speak kindly communicate with Dr. E. P. Poulton, The Downs, Woldingham, Surrey.

Thursday, May 26th.

SECTION OF UROLOGY.
3.30 P.M., at St. Thomas's Hopital: *Operations* by Mr. Cyril Nitch.
8.30 P.M., at 1, Wimpole-street, W.
Annual General Meeting—Election of Officers and Council.
Paper: Mr. V. Zachary Cope: Genito-urinary Symptoms in Acute Appendicitis.
Demonstration: Mr. Swift Joly: Demonstration of a New Operating Cystoscope.

Friday, May 27th.

SECTION OF STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Annual General Meeting—Election of Officers and Council.
Cases will be shown.
Communication: Dr. Hugh Thursfield: The Diagnosis of a Case of Renal Calculus in a Child.

SECTION OF EPIDEMIOLOGY AND STATE MEDICINE: at 8.30 P.M.
Annual General Meeting—Election of Officers and Council.
Papers: Dr. R. J. Reece: Some Observations on the Occurrence of Cow-pox and Human Cases in connexion therewith.
Dr. F. R. Blaxall: Some Notes on the Preparation of Vaccine Lymph at the Government Lymph Laboratory.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, May 23rd.—8 P.M., Annual General Meeting—Election of Officers and Council for 1921-1922. 9 P.M., Annual Oration:—Lord Dawson of Penn: The Colon and Colitis. Followed by a Conversazione.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W.
TUESDAY, May 24th.—8.30 P.M., Paper:—Dr. W. G. H. Cook: The Liability of the Insane in Respect of Civil Wrongs.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C. 1.
MEDICAL SCHOOL.

MONDAY, May 23rd.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Lecture:—Dr. A. Turner: Neuroses.
TUESDAY, May 24th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Dr. J. Taylor (Lecture Room): Demonstration of Cases.
THURSDAY, May 26th.—2 P.M., Out-patient Clinic: Dr. Farquhar Buzzard. 3.30 P.M., Lecture:—Mr. Scott: Investigation of Cases of Vertigo. (II.)
FRIDAY, May 27th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Dr. Grainger Stewart: Sciatic Nerve Lesions.

NEUROLOGICAL OPHTHALMOLOGY.

WEDNESDAY, May 25th.—3.30 P.M., Mr. Leslie Paton: Ocular Palsies.

Fee for Post-Graduate Course £7 7s. C. M. HINDS HOWELL, Dean.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON), Turner-street, Mile End, E.
Courses of Lectures:—
A Course of Fourteen Lectures on Psycho-Neuroses, to be given by Dr. M. Culpin in the Clinical Theatre of the Hospital. Open to Students of the Hospital and to Members of the Profession.
TUESDAY, May 24th.—5.15 P.M., Lecture VII.:— Dreams.
FRIDAY.—5.15 P.M., Lecture VIII.:—Symptomatology.

Advanced Lectures in Physiology, to Students of the University and to others interested in the subject.
A Course of Eight Lectures on Reception of Sensory Stimuli, to be given by Prof. H. E. Roaf in the Physiology Theatre.
THURSDAY.—4.30 P.M., Lecture III.

ST. BARTHOLOMEW'S HOSPITAL (UNIVERSITY OF LONDON), West Smithfield, E.C.
A Course of Eight Advanced Lectures in Physiology, to be given in the Physiological Laboratory, to Students of the University and others interested in the subject.
TUESDAY, May 24th.—4.30 P.M., Lecture IV.:—Prof. W. M. Bayliss: The Reaction of the Blood.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, May 23rd.—2 P.M., Dr. Simson: Diseases of Women. Dr. S. Pinchin: Medical Out-patients. Dr. Morton: X Ray Department. 5 P.M., Lecture:—Dr. A. Saunders: Gastric Disorders in Infants.
TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 12 noon, Mr. T. Gray: Demonstration of Fractures. 2 P.M., Dr. Burnford: Medical Out-patients. Dr. Pernet: Skin Department. 2.30 P.M., Mr. Addison: Visit to Surgical Wards. 5 P.M., Lecture:—Mr. B. Harman: Blind and Partly Blind Children.
WEDNESDAY.—10 A.M., Mr. MacDonald: Genito-Urinary Department. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Gibb: Eye Department. 2.30 P.M., Mr. D. Armour: Demonstration of Cases (Surgical Wards). 5 P.M., Lecture:—Dr. G. Stewart: Cranial Nerve Palsies.
THURSDAY.—10.30 A.M., Dr. Simson: Gynæcological Demonstration. 2 P.M., Mr. B. Harman: Eye Department. Mr. Baldwin: Orthopædic Department. 5 P.M., Special Lecture-Demonstration:—Dr. L. S. Burrell: Artificial Pneumothorax (open to all medical practitioners).
FRIDAY.—10 A.M., Dr. Robinson: Gynæcological Operations and Visit to Wards. 11 A.M., Dr. McDougal: Electrical Department. 12.15 P.M., Dr. Burnford: Applied Pathology. 2 P.M., Mr. Banks Davis: Diseases of the Throat, Nose, and Ear. 2.30 P.M., Dr. Pritchard: Visit to Medical Wards. 5 P.M., Lecture:—Sir R. Armstrong-Jones: The Common Forms of Mental Disease.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy Department. 10 A.M., Dr. A. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. Mr. Sinclair: Surgical Out-patients.
Daily:—10 A.M. Visit of Post-graduates to Wards. 2 P.M., In-patient, Out-patient Clinics and Operations.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN (UNIVERSITY OF LONDON), Hunter-street, W.C.
Post-Graduate Course of Instruction in Treatment of Venereal Diseases.
A Course arranged by the London (Royal Free Hospital) School of Medicine for Women, the Royal Free Hospital, the Elizabeth Garrett Anderson Hospital and the London Lock Hospital, for the instruction of qualified medical women in the Treatment of Venereal Diseases. The Course will extend over two weeks.
MONDAY, May 23rd.—2.30 P.M., Miss M. Basden: Visit to Maternity Wards and Labour Department (at the London Lock Hospital, Harrow-road). 5 P.M., Mrs. Rorke, M.B.: Out-patient Cliniques for Women and Children (at the Royal Free Hospital, Gray's Inn-road).
TUESDAY.—9.30 A.M., Injections (at the London Lock Hospital, 283, Harrow-road). 2 P.M., Mr. C. Gibbs: Clinical Demonstration and Visit to Wards (at the Female Lock Hospital, Harrow-road). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital, 144, Euston-road, N.W.)
WEDNESDAY.—11 A.M., Dr. D. Thomson: Pathological Lecture and Demonstration (at the London Lock Hospital, 91, Dean-street, W.) 3.30 P.M., Mr. J. E. Lane: Clinical Demonstration by and Visit to Wards and Out-patient Department (at the London Lock Hospital, Harrow-road).
THURSDAY.—2 P.M., Mr. J. E. R. McDonagh: Clinical Demonstration by and Visit to Wards (at the London Lock Hospital, Harrow-road). 5 P.M., Mrs. Rorke, M.B.: Injections (at the Royal Free Hospital, Gray's Inn-road).
FRIDAY.—10 A.M., Mrs. Rorke, M.B.: Treatment Ante-natal Cases (at the Royal Free Hospital). 5 P.M., Mr. J. J. Abraham: Clinical Demonstration, Injections, and Out-patient Clinique for Women and Children (at the London Lock Hospital, 91, Dean-street, W.). 6.30 P.M., Dr. Ruth Balmer: Out-patient Cliniques for Women and Children (at the Elizabeth Garrett Anderson Hospital).
SATURDAY.—9.15 A.M., Dr. Ruth Balmer: Injections (at the Elizabeth Garrett Anderson Hospital).

QUEEN'S HOSPITAL FOR CHILDREN, Hackney road, E.
A Course of Post-Graduate Clinical Lectures and Demonstrations in the Board Room of the Hospital, free to Medical Practitioners and Students of Medicine.
MONDAY, May 23rd.—4 P.M., Mr. M. Vlasto: Tonsils and Adenoids in Children.
TUESDAY.—4 P.M., Mr. A. H. Todd: Common Disabilities of the Lower Limbs (other than Paralytic) in Children (I.).
WEDNESDAY.—4 P.M., Dr. G. Bourne: Treatment of Heart Disease in Children.
THURSDAY.—12 noon, Mr. V. Nesfield: The Treatment of Corneal Opacities by Sub-conjunctival Injections of Phenolaine Solution.

TAVISTOCK CLINIC FOR FUNCTIONAL NERVE CASES, 51, Tavistock-square, W.C.
A Course of Ten Lectures on Elementary Psychotherapy, to be given by Dr. H. C. Miller, at the Kingsway Hall, Kingsway, W.C.
FRIDAY, May 27th.—5.15 P.M., Lecture IV.: The Unconscious Motive; The Centre of Analytical Psychology.

INSTITUTE OF PATHOLOGY AND RESEARCH, St. Mary's Hospital, in the Lecture-room of the Bacteriological Department.
A Course of Lectures on Pathological Research in its Relation to Medicine, open to all Members of the Profession and Students.
THURSDAY, May 26th.—4.30 P.M., Dr. J. A. Murray: Aims and Progress of the Experimental Study of Cancer.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, May 24th.—4.30 P.M., Lecture:—Mr. Smith: Diagnosis of Rectal Conditions.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES, 24, Acomb-street, Whitworth Park.
Special Course of Lectures in Gynæcology.
WEDNESDAY, May 25th.—11 A.M., Demonstration Operations.
THURSDAY.—4.30 P.M., Lecture VII.:—Dr. A. C. Magian: Vulvo-vaginitis.

Notes, Short Comments, and Answers to Correspondents.

PUBLIC HEALTH AND THE PLUMBER: A NATIONAL APPRENTICESHIP SCHEME.

DURING April the Master, Wardens, and Court of the Plumbers' Company gave a luncheon at Carpenters' Hall to celebrate the inauguration of the new national scheme for apprenticeship in the plumbing trade. Apprenticeship as hitherto understood has practically died out in the South of England, while surviving in the North and Midlands, and a strong body of opinion now supports a scheme of far-reaching voluntary apprenticeship; such a scheme, brought forward by the united action of the Plumbers' Company, the Institute of Plumbers, and the United Operative Plumbers' and Domestic Engineers' Association, has been approved by the Board of Education, and Mr. H. A. L. Fisher, President of the Board, was amongst those gathered at the above-mentioned function to give the scheme a cordial send-off. The Plumbers' Company is the registration authority of the trade; since 1886 a system of voluntary registration has been maintained in order to ensure a high standard of workmanship and practice, and so secure and retain the confidence of health and water authorities, medical officers of health, architects, and engineers, and also to provide for better training by technical education adapted to new conditions. The Company has now pledged itself to compulsory registration if the latter can be obtained. The question of registration is, of course, intimately bound up with that of apprenticeship; the new scheme of indenture provides for the introduction of a fourth party, independent of the trade, whose function will be to hold the balance evenly between the other parties. No previous scheme of apprenticeship has had the hearty coöperation of all the bodies connected with the plumbing trade, and it is now felt that at last a real effort is being made to establish the trade on a scientific basis. Hitherto, it has been recognised, insufficient education has resulted in defects; from very early times (the first official record of the Company's existence dates from 1365) the plumber's responsibility has been recognised, and emphasised by exhortations to him "well and truly" to perform his work, together with statements of penalties attaching to scamped labour or dishonesty.

The science of public health demands the close coöperation of the plumber—drainage, lighting, and certain processes of commerce call for skill and exactitude on his part, and so little is known, even by medical men, of the details of the technique required in his work that coöperation is not so close as it ought to be. A recent publication on this subject, entitled "Domestic Sanitary Engineering and Plumbing," by F. W. Raynes (second edition. London: Longmans, Green, and Co., 1920, pp. 474, 21*s.*), written for students of domestic sanitary engineering and plumbing, and those entrusted with the design, supervision, and execution of this branch of engineering work, is particularly rich in illustrations and makes pleasant reading for the amateur. The chapters deal in a practical way with the various sanitary considerations required in building a house, and give information of much value to the medical practitioner. The plumber is a very necessary ally in any scheme for improvement in house construction, and no one interested in public health affairs can fail to approve of the new attempt to increase the usefulness of his ancient and important craft.

COCKROACHES: THEIR HISTORY AND CONTROL.

THE life-history and control of the cockroach are the subjects of a pamphlet recently issued by the British Museum (Natural History). The pamphlet (Economic Series, No. 12) is the work of Mr. Frederick Laing, M.A., B.Sc., Assistant in the Department of Entomology of the Museum; it contains a concise description of the common cockroach (*Blatta orientalis*) and the German cockroach (*Blattella germanica*), the two species of the insect which are found commonly in houses in this country. It is observed at the outset that the popular name of "black-beetle" is inaccurate; the cockroach is one of the Orthoptera, an order more primitive than the Coleoptera. The common and German cockroaches are neither of them indigenous in England, having apparently been introduced into the country by infested shipping, the former during the sixteenth century, the latter possibly about the time of the Crimean War.

Habits of the Cockroach.

The habits of the two species are very similar; their flattened bodies enable them to gain entrance through very small cracks and crevices, and to shelter almost anywhere. The neighbourhood of a kitchen range is, of course, their favourite spot; in certain parts of London the gas companies' men frequently find the space between the oven and the top of the gas-cooker filled with a thick mass of roasted cockroaches. Basements are particularly liable to be infested; heat, damp, and a good supply of food are essential for multiplication of the insects; nothing edible is refused by them—wall-paper, whitewash, books, boots, and hair are all devoured freely, but sweetened foods, and particularly beer, form the strongest attractions. The harm done is not so much the quantity eaten as the quantity spoilt; cockroaches leave their excreta over everything, and also communicate the peculiar "roachy" flavour to tainted food by means of a waxy secretion from certain glands, and by saliva ejected from the mouth. Infestation of dwelling-houses takes place by the introduction of furniture, groceries, linen, &c., from sources already infested. Hotels and restaurants are frequently centres of dissemination. The two species of cockroach are very rarely found together; *Blatta orientalis* is the dominant species in this country, but when *Blattella germanica* occurs it is usually found in very large numbers, owing to its greater rapidity in breeding. The cockroach is normally a scavenger, and may sometimes be useful in removing dead animal matter. It also preys upon, and finally eradicates, the bed-bug—an advantage which in England does not countervail the unpleasantness of its own presence.

The Common Cockroach.—German, American, and Australian Cockroaches.

The sexes of the common cockroach differ markedly in appearance; the elytra and wings are strongly developed in the male, but rudimentary in the female; neither is black in colour, but a very dark brown. The antennæ are nearly as long as the body, and composed of many segments; they are liable to get broken, but like many other insects the cockroach has the power of regenerating lost parts provided the final adult stage of growth has not been reached, and provided a stump of the damaged organ remains. The cockroach grows in stages terminated by moults (of which the number and periodicity are not accurately known, partly because the insect eats its cast cuticle) and if injured the antennæ—or leg, as the case may be—never assume a perfect form at the next moult. The female of the common cockroach preponderates over the male in a proportion of about 3 to 1. Paring is confined to certain months—probably from April to September—and oviposition begins about a week after pairing; the eggs are laid in a capsule, arranged in two rows of about eight eggs each, and the female may carry the capsule protruding from the extremity of the abdomen for from 12 hours to four or five days, at the end of which time she deposits it in a warm sheltered spot, preferably near a food-supply. Normal hatching probably occurs within a few days; the capsule splits and the larvæ emerge to fend for themselves, as the mother takes no interest in her progeny. Each female is capable of laying a number of capsules—experiments have shown an average of eight, from each of which an average of ten larvæ were hatched; an immediate progeny of 80 may thus derive from one insect.

The German cockroach is dark yellow or light brown in colour, being only about half the size of the common species. Both sexes have fully developed wings; the proportion of females to males is apparently about 9 to 1, and pairing occurs at any time during the year. The female is sometimes said to be capable of laying only one capsule, but it is also held that two at least may be laid. *Blattella germanica*, unlike *Blatta orientalis*, assists her young to hatch. The American cockroach (*Periplaneta americana*) and the Australian cockroach (*Periplaneta australasiæ*) are not often found in dwelling-houses in this country. The former is the largest of our domestic species, reaching a length of about 35 mm.; it is mainly confined to warehouses, breweries, sugar-refineries, &c. The Australian species is similar but smaller, and is chiefly met with in glass-houses and forcing-pits, where it may do much damage by nibbling at plants, being more of a vegetarian and less of a scavenger than the other three varieties.

Cockroaches and Disease.—Methods of Control.

Cockroaches have not as yet been convicted of transmitting disease to human beings, although several attempts have been made to connect them with the dissemination of cancer. In one of these attempts[1] it was alleged that a worm in the rat passed its larval stage in the intestine of the cockroach; the rat ate the cockroach and became infested with the worm, which caused tumours found, on examination of the rat, to be of a cancerous nature. But there is as yet no very substantial evidence to go upon; the most that can be said is that the presence of the cockroach is unpleasant and its habits destructive.

To rid the house of these insects special attention should be paid to brick and tile work around fireplaces, to skirting-boards and cupboards, and to the entrances of gas- and water-pipes. The pamphlet advises cementing up of all crevices, and various insect powders are recommended for

[1] See reference in THE LANCET, 1913, i., p. 361.

use afterwards. Of these a mixture of sodium fluoride and pyrethrum powder (in a proportion of 3 to 1) has been found very satisfactory and is harmless to pet animals. Powdered borax, sweetened or mixed with pyrethrum powder, and the well-known remedy of a mixture of one part of plaster-of-Paris with two parts of sugar, are also efficacious. Phosphorus paste is useful, but dangerous to other animals. Traps are to be bought or are easily made; stale beer and peeled bananas make the best bait. Sulphur dioxide, generated by burning brimstone, is the most efficient and least dangerous gas for fumigation; carbon bisulphide is useful, but very easily ignited, even from a distance. In places where heat can be applied a temperature of 130° F. can be relied upon to give good results, if maintained long enough to penetrate the lairs of the insects.

BLIND GARDENERS.

THE inaugural meeting of the Guild of Blind Gardeners is to be held on May 26th at the National Library for the Blind, 18, Tufton-street, Westminster, S.W. A suggestion to train the blind for land work was brought before the Ophthalmological Congress at Oxford in July, 1919; the committee appointed by the Council of the Congress has endorsed the draft scheme drawn up by Mrs. Adolphus Duncombe for the establishment of a school of gardening and farming for the blind, to which school ophthalmic surgeons can recommend their patients to go for necessary training. The object of the Guild is to encourage the blind to take up gardening as a healthy and interesting occupation, either as a means of earning a livelihood or in addition to any sedentary work in which they may already be engaged. The funds will be for the advancement of this object; it is hoped to raise sufficient to offer a scholarship to a man or woman who attains to a certain standard of knowledge in cultivation and manipulation of plants. At present no works on gardening exist in Braile; the National Library for the Blind is now engaged in the preparation of suitable books and pamphlets to assist blind students in their technical education.

Given the taste and aptitude for gardening it is hard to conceive a happier occupation for those handicapped by loss of sight. It is quite clear that the material benefit to be gained cannot be great; the blind man must work slowly, and State or philanthropic aid must be invoked to protect him from the necessity of competing in the market for his living. But the physical benefit of such work may be very great, and its psychological value to the individual, its opportunities for self-expression and intellectual development, will be enormous.

GOATS' MILK.

IN the Year Book for 1921, issued by the British Goat Society, Mr. F. J. Lloyd, F.I.C., F.C.S., has an informing paper on goats' milk, in which he marshals some of the main facts already known about it, and calls attention to various related points on which further research is desirable. It is pointed out that any attempt to appraise the milk of an animal must obviously take cognizance of quantity as well as of quality, and in both these respects the goat varies a good deal, the quantity yielded ranging from 1 to 10 lb. a day, with 5 lb. as a fair average, the quality, especially as regards the fat content, varying quite as widely. The figures given for the 1920 Dairy Show indicate a fat variation from 2·17 to 9·53 per cent., the average being under 5 per cent.; and although this marks a distinct advance on the results obtained in previous years the author is emphatically of the opinion that there is still room for improvement, and that the first desideratum is to obtain a more uniform standard in the produce of the goat. The suggestion is made that the fluctuations in quality observed depend not so much on the exceptional circumstances, which are often the causes of an abnormal milk yield in cows, as upon the fact that there are probably a far greater number of goats which naturally yield milk of poor quality than owners and breeders of goats realise. The remedy both for deficient quality and quantity is therefore careful selective breeding, with the elimination of animals yielding milk of an inferior quality, rather than an attempt at improvement by means of drugs or special feeding. Mr. Lloyd believes, however, that the amount of casein, and probably of albumin also, in goats' milk—both of which constituents are present in much greater amount than in cows' milk—depends on the presence of lime in the food; in this respect his conclusions coincide with those of Fingerling, who found that in goats fed on a diet deficient in calcium and phosphorus a fall occurred both in the amount of constituents and of the total milk secreted; both of these returned to the normal on restoring the calcium and phosphates to the diet. One point raised upon which further information is desirable, and could easily be obtained, is whether or not the fat content of goats' milk diminishes with prolonged milking, as one investigator has stated to be the case. Other points requiring elucidation are the degree of relationship, if any, between the phosphoric acid and the casein present, as well as between the calcium and the casein.

With regard to the question of tuberculous infection in goats, the general opinion seems to be that the disease, if it occurs at all in this animal, is relatively rare; and Mr. Lloyd suggests that this comparative immunity may be due to the presence in the goat of an antitoxin to tuberculosis, seeing in this a rational basis for the old and widespread belief in the efficacy of goats' milk as a food for tuberculous patients. There exists undoubtedly a field for useful research in this direction, as also for the determination, quantitatively and qualitatively, of the vitamin content. Mr. Lloyd remarks truly that until recently chemical analysis has possibly concerned itself overmuch with the gross constituents of food materials at the expense of those substances to which, in spite of the minute quantities in which they are present, the main virtue of those food materials may be due.

APPROVED SALVARSAN SUBSTITUTES.

LOCAL authorities are authorised to supply, free of charge to medical practitioners, only those substitutes for salvarsan and neo-salvarsan which have received the approval of the Ministry of Health. In the most recent list (Circular 166) the approved drugs are given as follows:—

Arsenobillon (May and Baker) in doses of 0·1–0·6 g. (costing 1*s.* to 5*s.*). Novarsenobillon (May and Baker) in doses of 0·15–0·9 g. (costing 9*d.* to 4*s.* 6*d.*).

Diarsenol (Allen and Hanburys) in doses of 0·1–3 g. (costing 1*s.* to 22*s.*). Neodiarsenol (Allen and Hanburys) in doses of 0·15–4·5 g. (costing 9*d.* to 21*s.*).

Galyl (Anglo-French Drug Company) in doses of 0·1–0·4 g., dilute (costing 2*s.* to 5*s.* 6*d.*) or concentrated for intramuscular use (costing 2*s.* 6*d.* to 6*s.*).

Kharsivan (Burroughs, Wellcome) in doses of 0·1–0·6 g. (costing 1*s.* to 5*s.*). Neokharsivan (Burroughs, Wellcome) in doses of 0·15–0·9 g. (costing 9*d.* to 4*s.* 6*d.*).

Salvarsan (Evans, Sons, Lescher, and Webb) in doses of 0·1–3 g. (costing 1*s.* to 25*s.*).

The grant in aid of expenditure incurred by local authorities in the purchase of these drugs is based on the prices specified.

THE VALUE OF ALLOTMENTS: THE KING'S LEAD.

IN THE LANCET of Feb. 15th, 1919, we expressed the hope that allotments, which the war had made a national necessity, should remain a permanent feature of English life. Social unrest, with a consequent lowering of productive efficiency, as well as the vagaries of the weather (the late frosts have damaged the potato crops in various parts of the country), still enforce the need for encouraging allotment culture, and it is in keeping with His Majesty's interest in the welfare of his subjects that he should recognise this need. After the armistice the residents of Hampton Wick and Teddington had their allotments in Bushy Park taken from them. They appealed to the Master of the Horse for the King's permission to use one of the paddocks in the park for the cultivation of vegetables, and their request has been granted. The benefits of allotments to the community are of far-reaching good from whatever point of view they may be regarded—economical, physical, mental, or moral. From the health point of view, with which we are mainly concerned, there can be no doubt that fresh vigour has been given to the town dweller, who not only finds healthy recreation in cultivating his plot after the sedentary occupations of the day, but finds also in digging the necessary physical exercise which otherwise he probably would not obtain. The incentive to early rising, the enforced intake of fresh air, and the change of mental attitude are other factors in the management of an allotment which must conduce to health.

DATE OF THE INTRODUCTION OF ANÆSTHESIA.

IN a recent letter to the *Journal of the American Medical Association* the veteran Prof. W. W. Keen, of Philadelphia, pointed out that the article Anæsthesia in the "Encyclopædia Britannica" is incomplete as regards details given of the introduction of the process. He quotes the "Ether Day" address given by Professor W. H. Welch, of Johns Hopkins University, on Oct. 16th, 1908, to show that it was the operation (dissecting out of a tumour from the neck of one Gilbert Abbott) performed under surgical anæsthesia by Dr. John C. Warren at the Massachusetts General Hospital on Oct. 16th, 1846, in the presence of the Harvard medical students and of a number of distinguished medical men, which first demonstrated to the world at large the value of the method. The "Encyclopædia Britannica" gives Sept. 30th of the same year as the date of introduction; on that day Dr. W. T. G. Morton, a dentist of Boston, used ether to induce general anæsthesia for the purpose of extracting a tooth. This operation was done in private in Dr. Morton's office, and Dr. Morton himself is quoted[1] as referring to Warren's operation in these words: "This I consider to be the first demonstration of this new fact in science."

[1] Trials of a Public Benefactor, by Dr. Nathan P. Rice, New York, 1859, p. 63.